IN ART INDEX

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CONTENTS

	PAGE
The Painter's Handwriting in Modern French Art.....J. P. Hodin	181
Touch—The Neglected Sense.....Frances W. Herring	199
A Method for the Creation of Geometric Designs...Edwin M. Blake	216
Similarities of Musical Concepts in Ancient and Medieval Philosophy Julius Portnoy	235
Cubism and Science.....Paul M. Laporte	243
Reviews	
Creighton Gilbert, Paul Zucker, F. Cudworth Flint, Glen Haydon, Heimut Kuhn, W. K. Wimsatt, Jr., Joseph Remenyi, Charles Jones, Alfred Neumeyer, Finley Foster.....	256
International News and Correspondence.....	267
Letters Pro and Con.....	272
Contributors.....	273

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THE PAINTER'S HANDWRITING IN MODERN FRENCH ART

Thoughts on the Problem of Style in Art from Delacroix to Dali

J. P. HODIN

Touche and écriture. A new element, essential for the proper critical appreciation of a picture, has made itself felt in the course of the last hundred years, and has now taken its place—after considerations of absolute artistic quality—beside such constant elements as technique and material, composition, color, period and style, motive, etc. It is the visible evidence of the painter's handiwork—what the French call his *écriture*—his handwriting.

Touche is a notion often met with also in literature. Both words indicate aspects of the same phenomenon, but there is an important difference in their significance. *Touche* refers particularly to that which is personal and individual in the painter's brushwork, without inclusion of any formative element of style. With *touche* we can speak of style only in a subjective sense, rather in the sense in which it occurs in Buffon's dictum: "Le style est l'homme même." This saying does not mean that the character of the artist is reflected in the style of his work. It means that even if the work exhibits objective style elements, the mode of expressing them remains the artist's personal offering in which his own peculiar talent and originality make themselves known.

The idea expressed by *écriture*, however, does include objective style elements, which take us back to the origins of the artist's handwriting and enable us to grasp its essence and importance. The artist's handwriting has proved itself to be an indispensable means of critical research into matters of style, for it is at one and the same time a manifestation of his personality and a clue to his traditional affiliations. It is first-hand evidence of the artist's way of working. It is the most personal act of all artistic expression, inimitable in its subtlety, and therefore of primary importance in the attribution of the painter's work. (Roentgen photography, etc.)

Henri Focillon in the chapter, "Form in Material," of his study, *La Vie des Formes*, lays the greatest emphasis on the painter's mode of material expression as an element in the formation of style. "Structure is created in every moment in which the instrument (brush, palette knife or whatever it may be) leaves a trace behind it. This contact gives life to the picture as a whole, and to each individual object that characteristic form which manifests itself not only as value and colour, but also, and in its smallest quantity, as weight, density and movement . . . The value, the tone depends for its due effect upon the properties and relationships of its component parts; but it depends also on the way in which it

is painted, i.e., on how it is placed on the canvas. It is this that distinguishes the work of the artist from the work of the craftsman who paints the barn door or the baker's cart. Thus it is in the moment of his handiwork that the painter's picture acquires its rare and living significance."

Every work of art aspires to be something that never was before and never can happen again. As a matter of fact, each one represents a whole complex of relationships, and of these the relationship to tradition is for the moment our principal concern. The beginnings of the artist's handwriting lie at the point where his personality finds its contact with tradition. The history of art is written by personalities, not by "isms" or schools. Every artist builds on those that went before him or on those living and working in his own day. He builds his own world, taking to himself and working upon every sort of material that may further the attainment of his creative purpose. That is the essence of learning. The mere statement of influences and derivations (a practice of late much abused) can never take us to the root of the matter, especially in our days of sensation-seeking individualism, straining after new effects and personal advertisement, obeying the call of the art market rather than the voice of art itself. Our judgment goes to the root of the matter only when it becomes clear to us why the artist took over certain elements of style, how he absorbed them and through what alchemy he made them his own. Originality consciously sought is mere straining after effect. Real originality lies hidden in the personality of the artist. The truth of the matter is well expressed in the saying: "It isn't what is painted or how it is painted that matters; what matters is who paints it."

In other days the schools played a greater role than they do in our own. The school meant then the technique of a certain master to be painfully acquired. With its help, good painting should follow as a matter of course, and certainly in many cases it did. Take Giotto's revolutionary conception of painting (as against Byzantine formalism) and the school that grew out of it; Leonardo's sfumato technique; H. van Eyck's new oil color technique and the brilliant color bound up with it; Titian's rejection of the Flemish innovations and their brilliant color in favor of the total harmony of the picture, etc. Today the idea of a school is rather repellent than otherwise. Witness the followers of Picasso, Matisse, Bonnard, Dali, who took over the cast-off props of Cubism, Fauvism, Surrealism and Impressionism after the curtain had dropped on the play.

Here we should make a sharp distinction between the notion of *écriture* and that of technique. The practical, the technical procedure of the artist, the totality of his tradesman's routine, and the way in which form is brought to life in the material, are two different things. Here again arises the question of personality. In the last resort technique is purely personal and is born of an inner necessity. It may be that of an old master, that, say, of Rubens, who in most cases spread over a gesso priming a coat of streaky light grey, leaving traces of flat broad brush-strokes. Over this he sketched in light ochre tones, beginning with the shadows. The half tones, which should be cool, he laid in with strong grey, and over this he built up the form in a medium of balsam or spirit varnish. He strengthened the drawing and the shadows with tones of dark ochre and laid over the light planes half-covering tones to give a cool effect against the warm

ochres; after which he reinforced the colors of the lighter planes, placing the high lights with a loaded touch. Finally came his strong colors laid on over superimposed cool and warm glazes. Or the technique may be that of exclusively direct painting, as in so much modern work, which dispenses with so many of the old masters' effects in order to achieve others. The important thing is that the artist shall have realized his aim with his summary conception of form and the swift execution of his picture, as Rubens realized his in works of carnation-like fusion and luminosity. This, in the sense of Rembrandt's saying: "The picture is finished when the artist has said what he wanted to say."

The Transition from Conventionally Historic to Modern Handwriting. Delacroix, who held the view that the artist's handwriting should remain as visible as possible, made the following entry in his diary in 1857: ". . . even on the smoothest painting the trace of the brush is visible from near . . . The painter's handwriting serves the purpose of expressing more clearly and in a suitable way the various planes of objects. Strong broad strokes bring them into the foreground; gentler touches allow them to recede . . . Handwriting lends transparence to the tone according to its density . . ." This is one of the first and one of the weightiest passages on *écriture* in the literature of art. There were, of course, pictures of earlier masters wherein the handwriting was clearly visible, but in general the handwriting of the painter was not accorded any great importance. Pictures were smooth, often polished, and revealed little trace of the final coat of paint which completed the carefully underpainted work. A striking exception is Franz Hals with his spontaneous direct method of painting. By implication his conception was impressionistic, and in his emphasis on certain details and in his light key of color he anticipates Manet. Another forerunner of the moderns is Velasquez, with his light key of color and his painting of air. (*Villa Medici* in the Prado)

Mention of atmospheric painting brings us at once to the Dutch (for example, van Goyen), who influenced Bonington and Constable who, in their turn, were decisive factors in the development of the Barbizon school. Watteau might also be mentioned in this connection. In the heavily loaded later work of Rembrandt, the handwriting of the master is plainly visible. El Greco's dramatic summary technique had the same importance for modern French painting as had Titian's subdued, broken color, preferred by the master to the lighter scale as serving the total color harmony of his picture. The Japanese woodcut with its use of contour and its far-reaching simplification had also an influence.

Towards the end of the Renaissance, in the later pictures of Titian and Veronese, the painter's handwriting is plainly visible. It was thus in the Baroque period, when the subjective moment in artistic creation was most strongly emphasized, that the painter's handwriting began to assert itself. This development was interrupted by the classicist intermezzo of David and Ingres, but returned, together with vivid color, in the romantic painting of Delacroix.

The work of Delacroix, Th. Rousseau and Courbet is modern in character in spite of the imitative historical-stylistic element to be found in it. In the first half of the 19th century, modelling and color are bound together in the function of handwriting. Later the accent is rather on plane and color—on the well-de-

fined tract of color. The line goes from Corot over Daubigny, Sisley, Renoir to Bonnard; and to these may be added Seurat, Toulouse-Lautrec and van Gogh, whose handwriting includes the devices of cross-hatching and line. The outline as a stylistic element in the organization of the picture comes in with Daumier. After him, we meet with it frequently in modern painting as, for example, in the work of Manet, Matisse, Gauguin and Picasso. Here the blue outlines of Cézanne call for reference. In general the contour cuts into and limits the plane. Daumier's outline, which came perhaps from the graphic side of him, is nevertheless purely pictorial when he paints. There is an interesting phenomenon to be observed in the practice of Derain. He paints a form in depth with light and shadow, and cuts suddenly into the painting with a broad, nervous line which threatens to destroy his modelling—a symptom, no doubt, of his restless search for style.

For another group the three-dimensional is of prime importance. Starting from Daumier we can trace this line of development, after a temporary pause, over Cézanne and Derain to Picasso (a definite period) to Braque, to the New Realism and to Surrealism. After Constable, the work of the brush was displayed in a bold hand, but at the beginning of the century it became more subdued. Up to the time of Constable the painter's handwriting served mainly in the interpretation of plastic values. After Constable's discovery of broken color tones, its aid was invoked for the purposes of color. With Constable, too, began the modern practice of disintegrating the color material into facets, strokes or dots.

Together with the handwriting of the brush, the work of the palette knife should be noted. This tool has been used often to further the subsequent work of the brush, often again for the direct application of color to produce a desired impasto. Further devices worth mentioning are the cutting into the loaded material with the butt-end of the brush, the work of the hard brush in the compact color, etc. In all this, it is extremely important to observe how the handwriting of every painter shows essential differences within the line of his own artistic development. But for the time being we are unable to dwell at length upon this aspect of the matter. Such aspects of our material as we have been able to treat in this study must be taken as indications and, in very large measure, as reference to the illustrations. In this connection it would have been ideal to have been able to reproduce the brush-strokes in their natural size so as to convey a complete picture of the paint textures. Unfortunately we have not been able to do this.

Delacroix is a Romantic, but from the point of view of form, a Realist. The realist side of Delacroix comes very strongly into the foreground in his North African pictures, but it is a modern realism with hitherto unknown contractions and a summary conception of form. Our reproduction (Fig. 1) shows a detail of a sketch and for that reason is particularly suitable for our purpose. The big pictures of Delacroix are executed in a more conventional manner. His painting is composed of several layers of paint. The first layer is applied rather thinly and with a brush-stroke going with the form lengthwise. A constant striving after three-dimensional effect is expressed in it. (Delacroix's Diary 1852: "The

painter must lay in his figure like a sculptor working in clay or marble.") Then come light accents on the dry underpainting; these also follow the form but are laid on with a smaller brush. An axiom of Delacroix: "S'il faut ébaucher avec un balai, il faut terminer avec une aiguille." For this reason the handwriting of Delacroix lies principally on the surface, where the forms are broken with contrasting values. The whole procedure is traditional—color light and modelling as it might be with Veronese, or in the placing of the lights, with Rubens. The form is baroque, expansive, but he writes in finer characters than the baroque painters and his form is more intensively analyzed. Perhaps it was this that led Meier-Graefe to allude to Delacroix's demoniacal capacity for making the picture surface vibrate, and Elie Faure to speak of his flying handwriting. All modern painters, and not only the Impressionists, have their roots in Delacroix. (Cézanne: "We painters all spring from him.") And so it may be said that the handwriting of the modern painter goes back to the Baroque through the intermediary of Delacroix. (V. Volavka)[1]

The Realists and Pleinairists broke up the museum conception of art. They felt that the older art had a deadening effect. The old technique of glazing robbed painting of light and air. They went back to nature and made the discovery that a picture could not be painted out-of-doors with the methods of the studio. The face of nature is constantly changing, so they were forced to simplify and to stress only the most important. In their eager search for new motives the Realists and Pleinairists even discovered nature. The older art, with a few exceptions such as Brueghel and others, had no use for nature, or they regarded nature merely as a backcloth or a décor. In spite of their out-of-door practice, however, the Barbizon school never ventured to paint light; hence their forest interiors and their *paysages intimes*. From the point of view of handwriting, even *Théodore Rousseau* goes back to the Baroque. Allowing for his own personal variations, his conception is the same as that of Delacroix. Rousseau lays on the lighter passages with a softer, broader brush; his loaded light accents are less precise. (See his picture, *After The Storm.*) *Courbet*, the founder of programmatical Realism, owes a great deal to the Baroque. He makes use of a red ground, though not the red bole pigment of the baroque painters. (*The Girls on the Banks of the Seine.*) This picture marks the transition of Courbet's painting from the light and shadow period to the color painting of his later work. Color and lighting are baroque. Compare the work of Rubens or Jordaens. Courbet strives after realistic flesh tones and for this was called "*faiseur de la chair*" by Zola. Cézanne said of him that he was a navvy but that his handwriting was that of a classic. And Decamps observed: "Courbet is clever. His painting is heavy-fisted but he brings something fine into it. It is good broad painting, and there's tenderness in it too."

After the above-mentioned masters, the dispute with the older art seemed for the moderns to have come to an end. Other points of view demanded consideration. Manet turned back to Goya, Cézanne to Delacroix and Courbet, van Gogh to Delacroix, Daumier and Millet. In spite of their veneration of the old mas-

[1] This study is based on the research work undertaken in the years 1933/34 by the State School of Graphic Art in Prague under the direction of L. Sutnar and V. Volavka.

ters the attitude of the moderns towards them has undergone an essential change. In this connection an altogether new factor arises with Picasso.

Impressionism and Postimpressionism. Corot studied Dutch landscape painting, Claude Lorrain and Rembrandt, but he had an entirely new approach to nature. In those pictures whose *lumière crépuscule* (Baudelaire) conveys to the beholder a mood of so much beauty, color has begun to play an independent part as the vehicle of lyrical expression. While Delacroix still models, Corot hardly ever follows the form. His brush-strokes travel in one direction—the horizontal. Square and round touches are laid on with a fine brush, often one over the other, giving an impression that the picture was painted in layers. The brushwork is extremely sensitive; the color compact. Often he paints with a fluid opaque material. His scale of color is made up of fine greys, and yet he can be reckoned, from the point of view of technique, the first systematic Impressionist.

Daubigny (Fig. 9) is fundamentally freer than Corot. His art is an expression of artistic mobility and is served by a swift brushwork eager to seize and hold the fugitive impression. His verve and feeling for the dramatic are of a piece with his temperament. All are there to be read in his nervous and clamant brushwork. He renders the characteristic shapes of the landscape with big broad strokes. Constable's device of broken color is used by Daubigny to break up his space into flat planes. The color is often pressed heavily into the grain of the canvas with the palette knife; or it may be violently thrown on the canvas. The paint varies in thickness, from heavy loading to fluently painted tone values. But whether he paints with a dry or a fluid material, Daubigny is always hot on the chase after the impression.

The *Impressionists* took over the handwriting of Daubigny, and with it they completely revolutionized the color structure of the picture. They accepted Constable's principle of the division of color and carried it to its logical conclusion. New bright color! Every color was admissible with the exception of black—though Manet loved it. Everything was transformed into color, even the darks. Their point of view was naturalistic, but it led them not to naturalism but to abstraction in color. *Manet* (Fig. 2) found his own way from pre-Impressionist painting through Impressionism, and with his broad powerful brushwork and the dynamic force of the Goya *touche*, forged for himself his personal synthetic style without sacrifice of modelling. The principles of the old masters and those of the Impressionists both live in Manet.

Monet is the first orthodox Impressionist. Starting from Jongkind and Boudin and together with Pissaro (an issue of the Fontainebleau school), he laid the style foundation upon which Sisley built. Here we should mention Turner, whose painting of light was so much admired by Monet and Pissarro in the 70's of the last century. Pissarro, Monet and Sisley are the authentic Impressionists. The others often reckoned in their number (Cézanne, Manet, Renoir, Degas, Toulouse-Lautrec) are Impressionists only in as far as they were confronted with the same problem. Their solution of it brought them to different results.

Sisley's handwriting is typically impressionist (Fig. 10). The principal theme of his work is to express light as color, and this leads him to dissolve all objects in light and atmosphere. His brush dances over the canvas with the greatest assurance, leaving clearly defined strokes behind it. He uses a small brush and

often follows the forms with it. His touch is more sensitive and less bold than that of Daubigny, not so glittering as that of Monet. (The dazzling surfaces of Impressionism are due to the disintegrating effect of light on color.) Sisley's touch is more vital than that of Pissarro; his system of broken color is more complicated; his scale of values is more differentiated; he works with greater assurance. He lays his color on with varied density and conveys through it an impression of humidity. This he arrives at by superimposing different values of the same color, one upon the other, so that a darker value lying upon a lighter is absorbed by it.

One sees in *Renoir* (Fig. 5) how a completely new approach to the problem of light and color can be linked technically with the old masters. Renoir's motive was first drawn on the canvas with pencil, and upon this he painted with light colors, seeming to produce his picture out of a fog. He never dwelt long upon any one passage, but laid glaze upon glaze until his picture achieved its enamel-like finish. There is never a hard touch to break the roundness of his forms. He begins to paint his glowing flesh tones with black and white and a trace of red, then feels for the surrounding tones that give them their effect; but he takes great care that the surrounding tones shall not come so near that they cramp the flesh. (Doerner.) It will be clear from our reproduction that Renoir's handwriting is not typically impressionist. Light, it is true, plays the principal part. The color loses its weight in light and seems to be breathed on the canvas, the grain of which in many cases remains visible. The brushwork is hardly visible except around the eyes, nose and mouth where he draws lightly with the brush. It is in connection with Renoir's technique that Meier-Graefe alludes to the artist's early years as a painter of porcelain. The canvas is more heavily loaded around the face, so as to bring the transparencies of the flesh into greater relief. The impasto passages show impulsive, masterly brushwork.

Bonnard demands consideration as the last of the Impressionists to arrive at an expressive synthesis. He won his way to a personal conception of color but he added nothing essentially new to impressionist technique. His diffuse vibrating brush-stroke lays on warm rich tones saturated with light. At first, he painted with a somewhat restricted palette; only later did he paint in direct sunlight. With thin glazes or with heavy impasto, à la prima or with an underpainting: Bonnard makes use of any and every means to secure the result aimed at. A conscious part of his artistic practice is the cutting down of his picture, which he often undertakes after completion of the painting, thus following Degas in company with Vuillard.

Pointillism seems a depersonalized method of painting compared with the individually temperamental handiwork of the Impressionists, but only relatively so when we compare the touch of *Seurat* (Fig. 7) with that of the less important *Signac*. A system of scientific, objective discipline designed to eliminate all accidental effects gives the Seurat picture its architectural character. Covered with confetti-like dots, all of the same size, arranged in tones which find their relationship only in the eye of the beholder, the Seurat picture conveys a singularly transparent impression. This is value painting carried out with almost mechanical precision.

"I follow," writes *van Gogh* to his brother, "no system in painting. I hammer

FIG. 2. MANET, *Emile Zola* (Detail)

FIG. 1. DELACROIX, *Tiger and Lion* (Detail)

FIG. 4. TOULOUSE-LAUTREC, *At the Moulin Rouge* (Detail)

FIG. 3. DAUMIER, *The Family at the Barricades* (Detail)

FIG. 6. VAN GOGH, *Landscape* (Detail)

FIG. 5. RENOIR, *The Lovers* (Detail)

FIG. 8. MATISSE, *The Arm* (Detail)

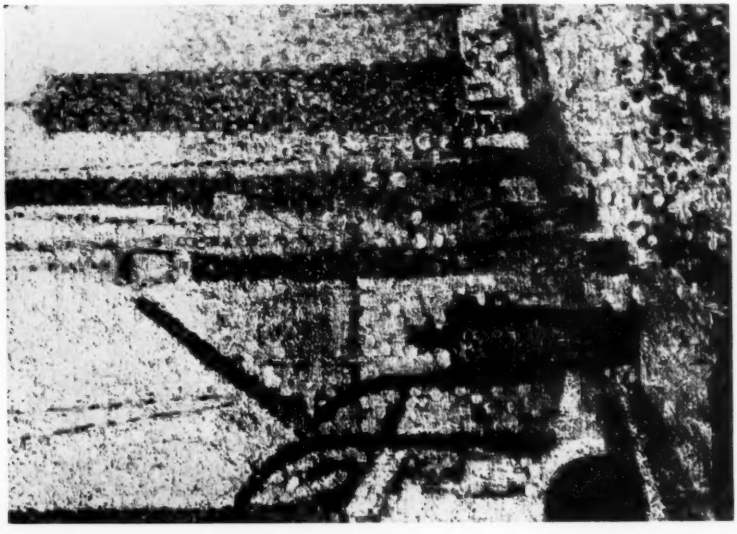

FIG. 7. SEURAT, *Harbor at Honfleur* (Detail)

FIG. 9. DAUBIGNY, *Kerity Le Vareck* (Detail)

FIG. 10. SISLEY, *Bridge in Sèvres* (Detail)

FIG. 11. CÉZANNE, *Fruit* (Detail)

FIG. 12. PICASSO, *Still Life 1937* (Detail)

away at the canvas with irregular strokes and let it all stay as it is—here and there impasto, raw canvas in places, unfinished corners. Brutalities!" His handwriting (Fig. 6) was all of a piece with his attitude towards nature—dramatic, uninhibited, following a biological process and a cosmic rhythm. If he wanted to render the power and solidity of the earth he never hesitated "to squeeze roots and trunks direct out of the tubes and then model them into place with the brush." Van Gogh's handwriting is a personal expression of utmost intensity. Its rhythm is that of heartbeats which become ever wilder as his mortal sickness grows upon him. Here painting and handwriting are one. And here, at the same time, that impressionist handwriting which began with Franz Hals receives its final expression. Our reproduction shows a small fragment of a field of waving corn from the painter's later Arles period. It well expresses the vehemence and impatience of van Gogh's temperament.

Toulouse-Lautrec (Fig. 4) is one of the first of post-impressionist masters. He lays on his paint with an easy virtuosity of brush-stroke stylistically related to that of Degas. His handwriting is more visible on the contours of his forms; elsewhere it tends to lose itself. Light does not play the dominant part here that it plays in impressionist painting. Hence the more precise form rendered with a small brush following the light and shadow. The outlines are continuous at times, and at others they are intermittent as the brush point strays from the canvas. Compared with the vibrating form of Renoir, that of Toulouse-Lautrec is concise and hard.

Gauguin's Tahiti pictures are decorative in construction, often resembling tapestry with woven brush-strokes. Gauguin began to paint with impressionist broken color, but as early as in his Brittany period he developed a severely formal picture construction, wherein flatly painted planes of color contrast strongly with each other. His broad brush-stroke does not always follow the form. He often delimits his forms with a thin outline. The ornamental is strongly marked in Gauguin's work, displaying itself in the juxtaposition of tracts of vivid color. He seldom loads, but works with thin color, as in his picture *Bonjour Monsieur Gauguin*. The rough texture of his canvas often forms part of his pictorial effect. Compared with the demoniacal tempo of van Gogh, the brushwork of Gauguin is quiet, aristocratic and controlled.

There is a realist attitude in the earliest pictures of *Matisse*, with an impressionistic handwriting which reminds one of Eduard Munch. In his neo-impressionist period Matisse painted rather in the manner of Signac with broad touches of pure color. It was after this that he attained the typical Matisse style (Fig. 8), which in its fused softness and confident sweeping brushwork in thin color calls to mind the work of Manet. (*Odalisques*) Only for a short period did Matisse load his canvas, and then he made frequent use of the painting knife. Quite early in his career he began to use outline as a structural form element. Here his draughtman's brushwork is easy to read. In many of his more recent pictures there is hardly a brush-stroke to be seen. The tracts of radiant color are laid on quite flat, and the contours are drawn with independent graphic intention. It often seems that the pictures of Matisse have an underpainting, but this is not the case. He is likely, however, to change the color scale of his picture entirely

in the course of the work and this may easily leave traces of the previous painting.

The Plastic, The Cubist and The Surrealist Picture. In critical studies on the history of art the view is often expressed that artists should not be classified under "isms." Grouping them together under general notions can, of course, only have reference to certain theoretical principles, and these concern only certain personalities. The individual artist develops out of them according to the irrational law of individuation. *Daumier* is an outstanding example of the impossibility of classification. According to his generation he should be classified as belonging to the historical style, but the third version of his picture *The Family at the Barricades* (a detail of which is reproduced in Fig. 3) flatly contradicts such a classification. Daumier, who may be termed a self-taught genius, finishes this picture with an aquarelle-like wash of color over an impasto, whereas the old masters followed the opposite practice of finishing by loading the lights. In the under layer the brush follows the form, as with Delacroix, except that Daumier divides the principal mass into planes of different value. Light makes form in Daumier's pictures. There is always a strong central lighting which brings the planes of light and shadow sharply against one another. Instead of high-lights, Daumier draws outlines round the forms with the narrow side of the brush. These contours reinforce the plastic impression in spite of the fact that their function in general is the presentation of a flat plane. In other pictures, e.g., *The Burden*, the heavy impasto appears on top, worked upon with long linear brush-strokes. The form is brought into relief with parallel cross-hatching, a practice which found no imitators among his immediate successors. A similar sort of workmanship is first seen again, perhaps, in Cézanne's unfinished portrait of J. Gasquet.

Cézanne is a milestone in the development of modern art, and at the same time its lawgiver. Starting from Daumier and Delacroix, his earlier work exhibits an extremely violent handwriting visible in thick oily paint. Later his color became thin and very bright. He worked a long while on a picture, leaving it often and coming back to it. Hence the effect of fluid color dissolved in turpentine. In his landscapes the brushwork goes in strokes of different direction, so that several strokes in nuances of the same color go to make up a larger color tract which then takes its place alongside neighbouring tones. One of his favourite devices is to enlist the cooperation of the white canvas, particularly on the contours, to reinforce, as it does, the harmony of the colored surfaces. With the years, his scale of color became ever more differentiated. Cézanne strove after plastic depth. This is particularly noticeable in his still lifes, although the objects, compared with those of Chardin or Courbet, are modelled in planes. Shadow as such is unknown to him. The Pleinairism in his *Bathing Women* is associated with a strong rhythmical impulse. This is borne out in the brushwork of regular strokes in the masses laid on with a fine brush and reinforced with outlines. Cézanne was not a great draughtsman. Hence his constant struggle with form. He often spoke of his difficulty in realizing his vision. His portraits are often unfinished, hands and clothes being merely indicated. And that was not because he willed it so. He knew, however, how to turn his weak-

ness into strength. He wanted to render nature more vividly, to represent an apple like a real material fruit and not like a ball. And so he sought after something completer than Impressionism had to give—something in the sense of the absolute permanent art of the past. With this aim he tried to yoke together the newer, more primitive approach to the object with the values of the Venetian masters or of Poussin. He looked upon himself as a modern primitive painter. The whole artistic development of Cézanne was one of constant seeking and devotion seldom met with even in the history of art. The portrait of J. G., already mentioned, shows that the graphic element of Daumier has been eliminated. The impressionistic fleck performs the same function for Cézanne that the plane does for Daumier. His mode of applying color proceeds from the heavier to the lighter material with the use of the broad brush. His tones and their application become more sublimated. The detail of one of his earlier still lifes of fruit reproduced here (Fig. 11) shows how countless superimposed layers of thin color produce an effect of impasto. The fruit is formed from within, outward, following the process of ripening.

Derain also experienced the urge to turn to the old masters, though in a manner different from Cézanne. He is, in spite of Picasso's witticism ("Derain, guide des musées"), a real artistic personality, and one in whose character there is a certain vein of tragedy. Derain began to paint in an impressionistic way but with his own personal note. (*Landing-stage at l'Estaque.*) Later, like all the others, he fell under the influence of Cézanne and painted with a smooth surface and fluid material. (Martigues) He often made use of earth colors. His gothic period, which lasted ten years, is artistically important. (*Saturday 1911/14*, etc.) After the first world war came a new realistic phase when he painted rather in the sense of Corot, but with elements derived from the Renaissance artists and the French Primitives. Derain paints with a smooth surface and with the illusion of depth. His out-of-door landscapes are painted direct and in one sitting. Those painted in the studio are more intensively studied. His heads and figures, often extremely simplified, are painted in planes with broad brushes and confident strokes of the brush.

Picasso (Fig. 12) linked up with Cézanne's principles of plastic construction in his picture, *The Seated Women*, painted about 1906, that is to say before the proclamation of analytic Cubism. But there is another element in it, that of Negro plastic art. The vehemence of the brushwork is typical for Picasso's passionate, painter's temperament. Take, by way of contrast, one of his cubist still-lifes and note the extreme versatility of his painter's handiwork. Picasso is Cubism; but he is more than that: he is the history of art in person. There can be no better example of the truth that the artist's handwriting and his search for style are one. There is no art period, no important artist, no phenomenon in the world of artistic creation that has not left its trace in the encyclopedic work of Picasso. The work of lunatics, children's drawings, Russian ikons, Assyrian reliefs, Catalonian and Pompeian frescoes, miniatures, handiwork of the artist craftsman: all are grist to his mill. The same endless variety is displayed in his painter's handwriting and handling of color. Picasso is a great sceptic—a relativist of genius. He deeply mistrusts the taste of his own age and rebels

against its judgments. Therefore he seeks and finds beauty in the productions of all times and all places. He has a most highly developed sense of form, which accounts for his preserving a classic element in almost all his work. To make an exhaustive count of all his creative periods—his blue period, his circus, Negro and Cézanne periods, the periods of analytic and synthetic Cubism, his Ingres, his pink Tanagra, his graphic periods—and to show how the style of each period was mirrored in its handwriting, would far outrun the framework of this study.

From a technical standpoint the contribution of Cubism to art is the application of the methods of monumental art to the art of the easel picture. Big surfaces look dead unless they give the realistic lustre and construction of the object. For this reason the Cubists, Braque and Picasso, enlivened their color by using a thick underpainting of tempera, on which they strewed sand or powdered cork. Another technical device was the use of real objects such as scraps of wall-paper, bits of newspaper, etc. (Collage). The device had already been used but was renewed, particularly by Braque, with happy artistic results. Occasionally, in order to avoid monotony and give an effect of spontaneity, an impressionistic touch appears in cubist still-lifes, together with a rather more objective handling of color. The cubist revolution in form consisted in representing things not as they appear to us optically, but objectively, in foreshortenings, in new hieroglyphics of experience.

Braque, a one time handworker, is a technician of great virtuosity whose typical excellence is the precise harmony of his color tones. In the synthetic period—about 1922/23—Braque no longer decomposed the forms into their elements, but sought to bring them together in larger constructions. His color was applied in this period often in two layers, the lower of which was black. Grapes, for example, are painted with an opaque green and the outlines are drawn with the color of the ground with a view to plastic effect, as the depth of space is given with the black tone. (Note in this connection the dark grounds of the Venetians.) The charm of the touch gets lost in this process, but is compensated for in the effect of the sand, which is used also in pictures of smaller format. The plastic effect is completed with highlights which seem at times to be scratched out with the butt-end of the brush.

Surrealism fixes its attention principally on the dream, in which we spend a third of our lives. It is theoretically hostile to the idealistic conception of the dream (the dream a higher life, etc.) and to the positivist conception that the dream is merely a product of the previous meal. It reaffirms the analytical method of Freud with its insistence on the motives of wish, anxiety, association and reality. This attitude dictates the motive and technique of the surrealist picture, which seeks to represent everything with the utmost objectivity so as to secure the desired fantastic effect. And evidently this effect is intensified when the individual objects are set forth in an artificial airless space in the most unexpected relations to each other. If, for example, a tree grows out of a matchbox the beholder is not impressed unless both objects are realistically represented. The consequence is that, technically, surrealist painting is uninteresting from the point of view of this study. It is a smooth, academic, almost banal way of using the painter's material.

Salvador Dali is the orthodox representative of this school. Seeing that the symbols of his surrealist art have cropped up in all countries, we can speak of a Surrealist school, but not so easily of the true spirit of Surrealism, the aim of which is to bring a province of the sub-conscious mind into the orbit of pictorial representation.

Masson is not a typical surrealist. In point of form he belongs to Cubism, a judgment which his methods of painting figures and surfaces confirm. His figures remind one of Picasso's, but are penetrated with a singularly fantastic, bizarre, baroque spirit. (A human being grows out of a tree, etc.) He personifies the dead through the living. But there is something spontaneous about his work. It exhibits improvisation and intensity, qualities otherwise lacking in Surrealism. They manifest themselves also in the handwriting of his pictures. He often paints direct, without retouch.

The art of *Chirico* is classic in character. His pictorial conception is plastic, the facture of his pictures smooth. His early work gave a diffuse, washed-out impression. Later it became linear. In his paintings of horses and gladiators, his conceptions resemble those of Pompeian frescoes and antique vase painting. Architecture, museum objects and monuments are the motives he uses to express his metaphysical scepticism, his yearning after old tradition and also a certain irony at the expense of the academicians. This is the equipment of his pictorial philosophy. He, too, assigns to dead things the functions of life. A tailor's dummy figures as a human being, and a human being as a tailor's dummy. Through the fine recession of the color tones in the severe perspectives of his pictures, suggesting antique scenes, Chirico succeeds in conveying a certain strange atmosphere.

Miró can be counted among the Surrealists in the years 1920/1924 and yet he, too, is a painter who, from the point of view of form, belongs to Cubism. He uses the cubist space of flat planes instead of the space of perceived reality, and he paints flatly with no element of illusion. Generally his pictures are smoothly painted. That the handwriting of these painters gives none of effects of the Impressionists is due to their guiding pictorial principles. The same holds good for the technique exhibited in the mechanistic-abstract work of F. Leger, the constructive work of Mondrian, etc.

The *Primitive* and the *Naive* occupy a relatively large space in the field of contemporary art tendencies. Negro art, the magic art of the South Seas, Gauguin's primitivism, the rediscovery of the French and Italian Primitives and of the decorative elements in ancient popular art, have all influenced in this direction. The douanier *Henri Rousseau* is genuinely naive. In a certain sense *Utrillo* and often *Chagall* display naivistic leanings. Chagall had a cubist period and later went over to Expressionism, a tendency of which *Rouault* is one of the few examples to be found in France. There is no consistent handwriting to be found in the work of Chagall, for the reason that he strains without inhibitions after the effect he desires. Comparing his handwriting with that of Cézanne's mature period, it might be said that the one is that of a gipsy fiddler and the other that of a violin virtuoso. Chagall laboriously paints red roses with heavy material on a white raised ground, but he smears in the surrounding space with a wash of thin, characterless paint. Utrillo is a product of Impressionism.

Henri Rousseau was self-taught, and an admirer of the old masters in the Louvre and of Persian and Indian miniatures. In his pictorial expression he is forthright and primitive, though here and there is an accent that recalls the old masters. His handwriting is a sort of drawing with large or small brushes, and follows an inner vision rather than nature. Rousseau invites comparison with the Trecentists in that his pictures, like theirs, are epic narratives, and everything represented tends to turn to the beholder; he is not a direct painter. His work is painstakingly executed and often reveals the presence of several layers of color. His form is always compact and clear, and, particularly in such later pieces as *The Snake Charmer*, the color is laid on with so smooth a finish that all trace of brushwork entirely disappears. There are other pictures of his, painted probably direct from nature and destined to serve as studies for his finished work, that are almost fauvist in their handling.

Looking back, we can say that, together with the discoveries of Impressionism in color, light and air (Sensualism), with the intellectual contribution of Cubism in respect to the absolute values of planes, of space and of the symbolism of objects, Surrealist sensationalism, the primitivist conception of the picture and primitivist simple pleasure in painting,—together with all these, the visible handwriting of the painter is an acquisition that has enriched modern painting with much rhythmic and psychological interest. But just because this element seems so arbitrary, it demands of the painter a masterly command of pictorial craftsmanship, without which it can be no more than an eloquent testimony to his lack of technical accomplishment.

TOUCH—THE NEGLECTED SENSE

An Inquiry into the Reasons for our Comparative Failure to Create and Enjoy Tactile Art Forms

FRANCES W. HERRING

Are there compelling reasons, aesthetic or psychological, for the virtual absence in Western countries of an art form which appeals primarily to the sense of touch? Or do we in America and Europe share a kind of cultural poverty in this regard, brought about by aesthetically irrelevant circumstances and attitudes?

Whatever the reasons, there can be little doubt of the fact that touch is regarded as an unimportant sense by most Occidental writers on aesthetic theory. The usual view is that, along with taste and smell, touch is unsuited to serve as the basis of an art form or of aesthetic experience. Consult the index of any book on art, whether written from a psychological, logical, technical or philosophical viewpoint, and the likelihood is that you will find touch not even mentioned in the index. A sentence or two in the text will suffice to dismiss the subject. Visit any art museum in America; the likelihood is that you will find

exhibits of beautiful objects locked securely behind glass, and prominent signs, "Please Do Not Touch", displayed in proximity to every tempting textile, pottery or piece of sculpture.

This state of affairs has come to seem to the writer so remarkable that it has provoked a prolonged examination of the literature of the subject, as well as many talks with artists and others, with a view to discovering why it exists.

Among writers on aesthetics some, one finds, hold disparaging opinions about the sense of touch, considered as an avenue of artistic experience. They state with conviction and finality that touch, taste and smell are lower senses, less honorific in a Platonic moral sense, than vision and hearing. But for the majority of theorists, it seems rather to be the case that, having noted painting, sculpture, music, literature, drama and the dance to be the chief art forms of Europe and America, they find it correct to ignore the sense of touch, to which no art form uniquely corresponds, as obviously (though not invidiously) irrelevant to the subject at hand. Some writers, however, justify briefly their rather summary treatment of the subject, and these statements have been culled and carefully considered. The reasons advanced for regarding the sense of touch as non-aesthetic may without strain be classified as variants of three main arguments which may be styled the *psychological*, the *technical* and the *philosophical* arguments, which will be here recapitulated.

I. The Psychological Argument. Touch, like taste and smell, is predominantly utilitarian in function. In touching an object, our reactions are instinctively practical and instrumental, leading to further bodily activity of an interested sort.

This is sometimes expressed as the fact that toward touch data it is almost impossible to maintain psychological distance—the degree of detachment necessary to the aesthetic reaction. DeWitt Parker (*Analysis of Art*, p. 45) expresses this objection as follows:

> The object of touch, and of taste . . . has to be brought into contact with the body; the practical reaction then follows; there is no time during which it may be suspended.

And Irwin Edman (*The World, the Arts and the Artist*, p. 24) puts it this way:

> The other senses too have their possible aesthetic exploitation, but touch, taste and smell are not as finely manipulable, not as easily incorporated in objects or detached from practical biological interests as are sight and sound.

This judgment is, of course, as old as the Greeks, although it is usually advanced today for other than the moral reasons adduced by Plato and Aristotle. It is also close to that of Aquinas (*Summa Theologica*):

> Those senses are most concerned with beauty which are most concerned in apprehension, namely the sight and hearing, which ministers to reason. For we speak of beautiful sights and sounds but do not give the name of beauty to the objects of other senses, such as tastes or smells . . . what simply satisfies desire is called good, but that whose very apprehension pleases is called beautiful.

Modern opinion supporting this view is even more closely related, perhaps, to that of Schopenhauer (*The World as Will and Idea*), who graded the senses in a

scale of aesthetic fitness according as they were closely or remotely related to the will:

> Sight, unlike the affections of the other senses, cannot, in itself, directly and through its sensuous effect, make the sensation of the special organ agreeable or disagreeable; that is, it has no immediate connexion with the will. In the case of hearing, this is to some extent otherwise; sounds can give pain directly, and they may also be sensuously agreeable directly and without regard to harmony or melody. Touch, as one with the feeling of the whole body, is still more subordinated to this direct influence upon the will; and yet there is such a thing as a sensation of touch which is neither painful nor pleasant. But smells are always either agreeable or disagreeable, and tastes still more so. Thus the last two senses are most closely related to the will—therefore they are always the most ignoble.

Many other illustrations of this argument could be quoted, for there is a long and weighty tradition behind the view that the psychological difficulty of divorcing the senses of touch, taste and smell from their utilitarian functions is virtually insurmountable.

We should note here one other point of view which seems to fall within the category of psychological, or perhaps of a sociological, argument. D. W. Gotshalk, whose new book, *Art and the Social Order*, follows DeWitt Parker to a large extent in his analysis of this particular problem, adds what he calls an "artificial" reason to Parker's "natural" ones explaining why sight and hearing are aesthetically superior to the other three senses, i.e. (p. 89):

> that sight and hearing are the customary everyday sensory channels of expression and communication . . . smell and touch, and taste, too, are not the most usual sensory channels of public expression and communication in human life. Sight and hearing are. We express and communicate publicly by writing, pointing, speaking, gesticulating—by visual and auditory signs—and other signs are usually ancillary to these. Possibly major fine arts can be developed which appeal primarily to taste, touch, or smell. These senses have considerable potentialities as avenues of aesthetic perception. But at present they are aesthetically inferior to sight and hearing . . . and under existing circumstances the appeal of the materials of art primarily to sight and hearing is therefore inevitable in view of the differential character of fine art.

While Gotshalk here grants a deal more than other writers so far quoted as to the possible future development of tactile art, he seems to conclude that existing difficulties are not likely to be overcome because of firmly established psychological habits.

II. The Technical Argument. There are no intrinsic principles of order in tactile sensations. They do not readily lend themselves to scalar arrangements of any sort. In fact, the fine discrimination required to distinguish one quality from another is rarely found in people. Only the blind have developed a language of touch. Yet, without such ordering principles, the necessary control of the medium is lacking. The aesthetic experience, even though genuine, must remain private. It cannot be communicated to others, given a dependable public character.

This explanation of the case appears more and more frequently from the 19th century on. One or two quotations may be in order. Aram Torossian (*A Guide to Aesthetics*, 1937) says:

> Works of art are visual or auditory objects simply because, as we have seen, their creation from olfactory, gustatory, or tactile sense-matter alone is extremely difficult if not im-

possible. (p. 37) . . . because the pattern involved in them cannot be made sufficiently complex to satisfy the shifting nature of our perception, not to mention also the difficulty of making the pattern sufficiently definite and permanent to be contemplated by others besides the creator himself. It is not easy to control the intensity, duration, mixture, and relationships of odors and tastes in order to convey the same or nearly the same impressions to different persons. I have found no case in which such an experiment has been tried with tactual sense-matter alone. (pp. 33-34).

DeWitt Parker, quoted above, agrees on this point (p. 45):

From the time of Plato, who writes of 'fair sights and sounds' only, vision and hearing have been recognized as the preeminently aesthetic senses. . . . And there are good reasons for their special fitness. . . . Important . . . is our greater power to control sensations of vision and hearing. Only colors, lines and sounds can be woven into complex and stable wholes.

III. The Philosophical Argument. Touch, unlike sight and hearing, is incapable of expressing the larger and deeper life experiences; of expressing values.

Even when this view is not explicitly stated, it is the clear implication of the definition or analysis of aesthetic experience, taken with the failure to include tactile experiences as possible sources of aesthetic emotion or appreciation. "Significance," "expressiveness," the argument goes, are not easily conveyed or realized through touch. To quote Parker once more (p. 46):

Nevertheless, the possibility of controlling colors and sounds and of creating stable and public objects out of them, is only a secondary reason for their aesthetic fitness. . . . The fundamental reason for the superiority of sights and sounds remains the possibility of communicating the larger and deeper life of feeling and thought through them.

These are three powerful arguments indeed, and should they prove unshakable, would be sufficient to account for the neglect which tactile experiences have customarily received at the hands of most aesthetic theorists, artists and the appreciative public in the countries of the West.

Before we venture upon an analysis of these arguments, however, let us observe that in rather recent times voices have been raised in question of these views. Beginning with Bernard Bosanquet, whose emphasis on the importance of the *medium* in determining art form perhaps naturally led him to recognize tactile qualities as significant[1], a growing chorus of artists and thinkers have testified to the aesthetic reality and possible significance of tactile experiences.

Bosanquet gives to touch a tempered and qualified recognition, to be sure (*Proceedings of Aristotelian Society*, Vol. I, No. 3, Part II, p. 98):

[1]Witness the following passage: "You cannot make the same things in clay as you can in wrought-iron, except by a *tour de force*. The feeling of the work is, I suppose, altogether different. The metal challenges you, coaxes you, as William Morris said of the molten glass, to do a particular kind of thing with it, where its tenacity and ductility make themselves felt. The clay, again, is delightful, I take it, to handle, to those who have a talent for it; but it is delightful of course in quite different manipulations from those of the wrought-iron . . . when you come to carry (patterns) out in the medium, then, if they are appropriate, or if you succeed in adapting them, they become each a special phase of the embodiment of your whole delight and interest of 'body-and-mind' in handling the clay or metal or wood or molten glass. It is alive in your hands, and its life grows or rather magically springs into shapes which it, and you in it, seem to desire and feel inevitable."

It is undoubtedly a remarkable fact that only sight and hearing are capable of aesthetic perception; or if it is maintained that pure touch without sight can apprehend the beauty of a pattern in relief or of a statue, then we must take in touch, so far as it deals with solidity. I mean as distinguished from the feeling of heat or cold. I suppose that the characteristic which makes these senses capable of being channels of the aesthetic perception is their ability to appreciate a structural whole, which seems to differentiate them from the senses of taste and smell, or of touch as dealing with mere heat and cold.

L. A. Reid, writing in 1931, leaves the door a little further ajar (*A Study in Aesthetics*, pp. 70–71, 396–397):

As in developed aesthetic experience the discrimination of form plays such an important part, it is natural and right that the objects of the two 'senses' whose discrimination of form is most highly evolved, namely vision and hearing, should receive in aesthetic practice and aesthetic writings the lion's share of attention. (Author's footnote: Touch is in a peculiar position. It is immensely important in *coming* to know the external world, and has therefore probably more significance at that stage, e.g., in the case of children or blind persons. Normally it acts as an adjunct of visual apprehension through tactual imagery.)

Harold Newton Lee, writing in 1938, marks the prevalence of the opinion that touch is outside the realm of genuine aesthetic experience, but in the end disagrees with this view (*Perception and Aesthetic Value*, pp. 26–27):

Ever since Plato and Aristotle, it has been maintained by some that sight and hearing are the aesthetic senses; sensations of sight and hearing can be beautiful, but the stimulation of the "lower senses" cannot.

This view has a specious plausibility, but it is fundamentally in error in assuming that any sensations, as sensations, are aesthetic. The material of the aesthetic experience is perception. The plausibility arises from the fact that most perceptions are built around sight and hearing; therefore the material of most aesthetic experiences is made up largely of sights and sounds.

. . . any attempt to maintain that aesthetic experiences must in the nature of the case be visual or auditory and that the "lower senses" cannot furnish the material of beauty seems to be based on sheer dogmatism.

Possibly the most vigorous defense of touch as aesthetic agent, however, comes from Helen Huss Parkhurst, writing in 1930 (*Beauty*, p. 67 ff.):

Against touch at least the argument of formlessness, of lack of structure, cannot be directed. Tactual qualities are a primitive, and remain a permanent, means of apprehension of size and shape. In the process of their gradual fusion with other qualities they become indeed so bound up with those of sight that blind handling of familiar things produces a no less complete realization of their appearance than of their form and dimensions. Conversely, the mere visual appearance of an object is sufficient to stimulate clear images of temperature, texture, and resistance.

. . . the tactile sense is the reality sense *par excellence*. From childhood forward we assist, when we can, our visual knowledge of things with their acquaintance through handling.

. . . What we care for, if the caring is bound up with qualities of touch, will be doubly, trebly, missed when it is taken from us. It is a question whether the loss of a little child or of a pet animal upon which protective fondling has been lavished could leave behind a sense of void so aching and poignant were it not that, besides the heart, the hands and the embracing arms are left yearning and empty. . . .

In view of the varied emotional significance of tactual sensations and of their combining power with qualities derived from sight, there would therefore seem to be little room for

doubt as to the propriety of locating the tactile and kinaesthetic senses in the same class with the organs that mediate colour and sound. Sufficient indication has been given of the intensity and volume of the sentiments engendered in this lowly way.

Such challenges, issued by some authorities to the views of other authorities, perhaps justify us in regarding the possibility of aesthetic tactile experience as at least worth further consideration. Let us therefore examine with some care the prevalent assumption that our reactions to tactile stimuli are almost necessarily non-aesthetic, because inevitably practical or instrumental.

IV. Consideration of the Psychological Argument. This argument is sometimes indirectly and tacitly developed by maintaining that in point of fact one seldom encounters the person who cultivates touch experiences for their intrinsic value; which gives weight to the idea that tactile sensa are not naturally aesthetic in character. The assertion is often positively made, however, that such cultivation is psychologically difficult, if not indeed impossible.

It seems clear that to hold the extreme latter view—that aesthetic tactile experience is impossible—is, to say the least, dogmatic. It ignores, for example, the development of the art forms appealing primarily to the sense of touch, as practiced for centuries by the Chinese. Most of us have seen in museums the delightful small objects shaped to the hand and often beautifully carved, which were designed by the Chinese artist to be carried about in the pocket for the joy of handling them. Authorities on art of the Orient attest that Chinese pottery, jade and ivory are consciously worked with a view to their being handled. Warren E. Cox, writing in 1946 on "Chinese Ivory Sculpture" says:

In my book on "Pottery and Porcelain" I spoke of the "tactile appeal" which a fine glaze has; that appeal which causes a Chinese collector to take a piece in his hands and run his fingers over it. The tactile appeal of old ivory is even greater than of an old glazed pottery. This is because, first of all, the surface is a carved one and not simply a melted one. The carver can work exactly the soft change of planes and subtility of curves he wishes. . . . But the tactile appeal of a piece of old ivory gains in another way: the touches of many hands over a long period of years impart a warm human quality that is hard to describe, but that certainly adds to its charm, and no amount of staining and rubbing can produce the same effect. . . .

A writer on "Chinese Jade: The Sense of Touch," in an article appearing in *Burlington Magazine for Connoisseurs* (1940, pp. 192 ff.), makes an even more unreserved statement, suggesting cultural causes for our Western attitude toward touch, and possible subtle psychological effects:

In public collections visitors have little opportunity to appreciate the more subtle aspect of this beautiful material. It needs very careful lighting if it is to be seen at all . . . moreover the material, so cool to the touch, needs to be handled—one might almost say caressed—if one is to understand its peculiar virtue.

This is something rather beyond the experience of the average European, though the Chinese have known it for centuries. We take it for granted that the sculptor should have sensitive fingers: it is a little strange to be told that the fingers of the beholder should be no less sensitive. Many an Englishman, bravely struggling upwards to the light from his Puritan past (which, be it said, has, as often as not, given his ear an exquisite judgment on the modulations of music, whether expressed in the verse of Milton or the harmonies of Purcell) has accepted the pleasures of sight with grateful enthusiasm but has shied away

from the pleasures of touch. Indeed, it may be that a blind man might be a finer connoisseur of jade than one with normal sight.

Rather oddly, this point of view has received little more than perfunctory notice in the usual literature on the subject—which is, in any case, small enough, but it has been marked, and memorably, by a modern master of English romantic prose, Mr. H. M. Tomlinson, in *Gallions Reach*. The reference is quite casual and fleeting but well worth bringing to the notice of collectors of jade. "What at once was seen there, and nothing else, was a bowl of pale jade that appeared to give the silence a faint light, as though it were a lamp. It was honorably isolated and elevated, as though it were the significance of a poet . . . he did not care to approach that luminous fragility . . . That? That bowl? Come and handle it. Such things are made to be touched as well as looked at. The touch should know as much as the eye . . . 'Sometimes,' said the Chinaman, 'I have wondered whether Western culture turned into chimney-smoke because of a neglected sense of touch.' "

Such comments seize the gauntlet and hurl it boldly at the feet of any Western theorist who would deny what is a palpable fact in the experience of millions of Eastern people. But even if we had not the experience of the Chinese to explode the theory that touch cannot be cultivated for the intrinsic disinterested pleasure of *touching*, we would be led to question it by the testimony of blind persons, by our observations of children and of artists, and by what we have learned of the art of primitive peoples.

More and more since the war, the art museums of America are assuming the task of providing "exhibits" for the blind, and their curators are beginning to remark that blind persons experience a keenness and wholeness of aesthetic delight as they approach art works through their fingers and hands, which those gifted with sight often seem to miss, and which those with sight might equally well receive. In an article "Fine Arts for the Blind," published in the *Magazine of Art* for January, 1943, John D. Morse suggests such a conclusion from his experience in conducting classes of blind children through the Metropolitan Museum in New York City. After reporting their exclamations of delight as they classified works of art, by touch, as belonging to one art period rather than another, and such discerning comments as: "We (Americans) resemble the Egyptians more than the Romans in our art forms today," Morse observes:

Deprived of the pleasure of color, these twenty blind children found the pleasure of texture and sculptural form which other museum visitors must get second-hand through their eyes . . . they were forced to concentrate all their attention on the works of art themselves . . . I anticipate the day when our museums will have rooms set aside fitted with "touchable" things from every country and period.

It is the writer's impression from reading and conversation that the curators of art museums in America are rapidly becoming ardent advocates of tactilism as one means of appreciating certain appropriate art forms; finding neither practical nor aesthetic reasons for discriminating against the sense of touch.

Normal children, one half-remembers, and easily confirms in conversation with those who work closely with them, derive pure delight from exploring the tactile qualities of objects—in the same direct way in which they enjoy, without instruction, visual shapes, colors and sounds for their intrinsic quality. Their reactions to objects cannot by any means be reduced to the utilitarian one of "coming to know" the world in a practical sense. They develop games, the point

of which lies in the repetition of tactile rhythms (often combined with sounds), and exhibit marked preferences for objects on the basis of tactile impressions alone.

Which of us has not carried horsechestnuts about in his pocket for the pleasure of handling their satin round solidity? Who has not sifted warm sea-sand through his fingers; ground smooth rubbed stones together in his hand; explored with his fingers the whorls and interstices of beach-worn wood, or pressed a sharp flint against his palm for the pleasure-pain of its unyielding edged resistance?

Even those aesthetic theorists who deny to touch any function as mediator of artistic material, occasionally emphasize that much of our aesthetic reaction to *nature* consists of tactile experiences. But if this is admitted, where is the case for the impossibility of tactilism as mediator of beauty? The argument is no longer one of the psychological impossibility of experiencing beauty through touch, but of some preferred definition as to the object of such experiences.[2]

Much evidence can be adduced as to the natural tactile pleasures to be received through sculpture. In point are the art and the art-responses of primitive peoples, as well as of medieval Europe; of children; and of artists themselves. Anyone familiar with the art of early African cultures, or of the Indians of North, South and Central America, can hardly have failed to mark that their objects of art seem to call out irresistibly to be handled. And many of the sculptures of medieval Europe have come down to us with the face of the Babe (for instance) almost obliterated, yet still infinitely appealing, by the loving hands that have passed across it, each one receiving something in the gesture.

W. R. Valentiner, speaking of the importance of touch in creating and appreciating this art form, brings forth evidence from each of these sources (*Origins of Modern Sculpture*, 1946):

> One can touch a piece of sculpture as if it were an organic being; it reminds one of organic forms . . .
>
> The earliest art we know, that of the paleolithic period, is plastic art. The beautifully cut stone implements of this epoch, and of the neolithic age, appeal at least as much to the sense of touch as they do to the eye. The stone hammers and knives are indeed visually pleasing in outline and form, but we cannot understand their artistic value if we see them only exhibited in cases. We have to take them into our hands and feel their pleasant smoothness, they are made to fit the hand. It was the warmth of touch which the earliest stone sculptor sought. The same generalization applies to early pottery. The best pieces of pre-Columbian, Peruvian and Central American ceramics, for instance, have to be handled if we want to understand the remarkable sensitiveness of their makers in modeling the surfaces . . .
>
> How closely art is connected with the sense of touch can be easily observed in museums, where visitors can hardly be prevented from handling the objects . . .

[2]W. R. Valentiner, in *Origins of Modern Sculpture*, puts it this way: "A piece of sculpture like the Human Concretion by the Swiss sculptor, Hans Arp, . . . affects us as beautifully shaped pebbles on some beaches do, but it has an additional aesthetic value given it by a conscious artist's mind, a symbolism expressed in a carefully-thought-out composition; while the pebbles have only accidental forms."

Sculpture can give a great deal of pleasure to the blind, as we learn from the visits Helen Keller paid to certain sculptors' studios . . .

Children are especially fond of fingering sculpture . . . In the Detroit Museum there is a piece of bronze sculpture . . . representing a young donkey in about half-size. The mouth, ears and back of the animal have been so rubbed by childrens' hands that the gold-colored metal now shines through the black patina, resulting in a very pleasing effect . . .

Sculptures are not always damaged by being touched a great deal. Indeed, certain kinds have their surface appearance improved by frequent rubbing; such, for instance, is the case with African Negro carvings and Renaissance bronzes . . . As with certain prehistoric implements, the quality of these sculptures cannot be completely understood unless their forms are felt by the fingers . . . it is less generally known that this applies also to medieval plastic art.

The great sculptors could not develop in us the strong appeal of the tactile sense if they did not themselves possess the emotional and sensual qualities necessary to produce such effects . . . When Maillol . . went with his friends to the Acropolis in Athens . . he used to caress the ancient stone with an almost religious love, while he meditated on the classical masters who seemed so close to him.

Such wealth of evidence as to its existence makes it somewhat ridiculous, then, to maintain that aesthetic response to tactile sensa is psychologically impossible.

One may hold, however, and many writers have done so, that the supremely practical uses to which our sensitive hands are put, in daily living, have destroyed or overlaid their capacity for disinterested aesthetic response for most of us.

To this, the observation is germane that if it is desired to do so, it should be possible with training to recapture, or with earlier training to keep alive, this capacity. The Bauhaus tradition, for example, makes much of tactile-training of children and of adults, both for its intrinsic satisfactions and as a means of developing the ability to render tactual qualities in painting and sculpture. Of course, persons probably differ as much in their capacities in this direction as in their sensitivities to colors and sounds. But it seems highly likely that any faculty which exists so universally in childhood and which is so highly developed in some adults, could be retained by most of us as we grow older and could perhaps be expanded in new aesthetic directions.

Gotshalk's observation that art follows communication in favoring sight and hearing over touch perhaps needs to be qualified by the reflection that even in matters of the customary channels of public expression, the use of touch is not outside our usual practice. The handclasp of greeting and parting, the French embrace of salute, the nose-rubbing of Eskimos, the hand-play of primitive dancers, are examples coming readily to mind.

Through gestures and speech we may achieve the greatest *impersonality* of social contact—an advantage no one would deny—but the contribution of conventionalized touch to the warmth of human gatherings is a quality most of us would not willingly forego. It is possible thereby to express and receive simple, massive and profound impressions which it is doubtful whether any distance receptor can produce.

But there is another facet to the argument that our responses to tactile

stimuli are instinctively *interested* and therefore non-aesthetic. This is the view that because the sense of touch is so intimately bound up with erotic expression, its exercise for the apprehending of form, texture, solidity for their own sakes is virtually a psychological impossibility. The writer has wondered, indeed, that this objection has not been more openly advanced in the literature of art; but at least it has been delicately suggested, and in modern writing is occasionally overtly stated. The close association of touch with eroticism may indeed go as far as any single reason toward explaining why there has been so little done with an art form appealing to this sense. If the psychological tie is too close to permit the unhinging, as it were, of the association, then tactilism is indeed outside the pale of Western society.

But is the sense of touch really unique in this respect? Can we deny that there is also a remarkably intimate relationship between the visual and auditory senses and erotic experience?

We must remember that Plato held that only martial music was free of dangerous and softening influence, pointing out the efficacy of music in arousing sexual desire. And the church has condemned in turn sculpture, drama and the dance as immoral for the same reason. Many of us who endured a Puritanical upbringing will attest that the novel and lyric poetry were regarded with suspicion as tending to relax moral firmness.

It need hardly be said that there are persons whose interest in painting, sculpture, music and the dance is so interwoven with primary sexual reactions that they cannot be said to know the aesthetic experience as such at all. Without doubt, also, the untutored first reactions of sexually awakened persons to the nude human figure in the arts, or to certain suggestive musical or choreographic rhythms, are far indeed from the responses which they may later be able to give to the same stimuli. There is often at the very least a kind of provincial embarrassment felt by those brought up in an unaesthetic tradition, which interferes for a time with the acquiring of the necessary detachment and self-forgetfulness to permit them to see and hear a work of art in a disinterested fashion. Nevertheless, few would deny that the erotic significance of the work of art is an integral and legitimate part of the work's expressiveness.

The question is not, whether a sense preeminently fitted to arouse erotic response is therefore incapable of serving as an avenue to "pure" aesthetic experience, but rather whether the sense of touch, alone of all the senses, is in fact found to be incapable of the degree of divorcement such experience requires.

In answer to this question I can do no more than elicit the aesthetic responses of the blind, of Orientals nurtured in another art tradition, of artists themselves and of that growing number of Western moderns who have had the experience of appreciating tactile art, and art tactually, in proof of the fact that such detachment has in fact proved to be not difficult to attain.

Our answer to the *psychological objection* to tactile art-experience, then, may be summarized by saying that while touch, like the other senses, serves preeminently practical uses, and although it may function as stimulant to erotic response, it is apparently capable of independent development as agent of aesthetic emotions, in a degree comparable to that attained by the senses of sight and hearing.

V. Consideration of the Technical Argument. In spite of the invention, by Christian Morgenstern's fictional character, Korff, of a smell-organ, and in spite of the rumored creation, in France, between the wars, of a "symphony for cheese," most of us would agree upon reflection that stable art forms directed toward the senses of smell and taste suffer from the transient character of the responses they evoke and the inherent difficulties of ordering them according to any aesthetic principles whatever.

But do the same objections hold for touch? Are the structural elements common to the visual and auditory arts—such elements as unity in variety, dominance and equilibrium—inapplicable to touch experiences? More: do the sense data uniquely given by touch correspond to no objectively measurable scales of order such as underlie hue, value and its intensity of color; or pitch, timbre, and intensity of tone?

In one sense this whole question lies outside the field of aesthetics. But because of the prominence given to the mechanics of measurement of music and painting, for example, and the familiar argument that the senses appealed to by these arts are adapted to aesthetic reaction partly because of our capacity to enjoy unconsciously the mathematically exact relationships between contrasting tones and hues, it seems necessary to spend a little time investigating the analogous position of touch in this regard.

One meaning of the assertion that tactile sensations have no principles of order is that they cannot be measured. Now it is obvious that units of measure do not present themselves ready-made on the surface of any type of sensa. What is required, if we are to measure any quality, is first of all the ability to distinguish it as present or absent, all or none, there or not there. Then, with attention and training, it may be possible to distinguish degrees (quantities) of presence of a quality (an ordinal dimension). The last step is to invent and name units which correspond to our perceptive abilities to distinguish such quantities, and to arrange them on a scale in order of size (a cardinal dimension).

Is anyone prepared to say that the qualities discernible through touch are intrinsically a-dimensional in the first (ordinal) sense? Surely the ability to detect degrees of presence of tactile quality is within the power of most of us. We can distinguish degrees of lightness to heaviness—a weight dimension; we can distinguish degrees of softness to hardness—a solidity dimension; degrees of warmth to coldness—a temperature dimension; degrees of smoothness to roughness—a texture dimension. Other scales, less frequently used are theoretically possible: pliability to rigidity; friability to strength, etc. And experiments have shown that sensitivity of discrimination in all these directions can be greatly refined with practice.[3]

[3] Cf. the following instructions to buyers, appearing in Isabel Wingate's *Textile Fabrics* (1942, p. 49 ff., "Ways of Recognizing Textile Fabrics"): "The warmth, coolness, softness, pliability, smoothness or strength of a cloth can best be judged by the sense of touch. Buyers should feel every piece of textile merchandise that is offered them . . . To feel goods, grasp the edge of a cloth between the thumb and index finger, with the thumb on top. Rub the thumb and forefinger across the cloth, then lengthwise, then in a circle. Each time a fabric is felt, words that best describe the feel should be brought to mind: pliability, elasticity or 'give', warmth, softness, smoothness, and so on."

This analysis reveals a tactile situation analogous to that in which we say that a person can recognize differences of tone, or shades of a color, by the appropriate sense. But aesthetic theory has customarily regarded as significant the existence, in the case of music and painting, of an underlying physical structure which accounts for the order of our sense impressions. Are there no such physical measurables underlying the phenomena apprehended through the sense of touch?

Of course there are. Cardinal units for measuring weight and temperature are among the first invented by man; and the needs of modern industry have stimulated the development of uniform measures of many other tactilely distinguishable qualities. Texture, for example, is shown to be a matter of size of surface interstices; and it is possible to measure with increasing accuracy the tensile strength, rigidity, friability of objects. Experiments are continually being performed with a view to standardization of measures and of terminology, regarding other qualities ordinarily distinguishable in a rough way by touch, or by touch-and-sight.

There has been a deal of confused thinking on this subject in the literature. One source of confusion here has been the failure to keep clearly in mind the fact that many sense data apprehended as sight and sound, are actually complex in origin, having been built by the combined action of eyes, ears and hands.

In experience our sense organs are seldom exercised separately but are simultaneously engaged in exploring objects which appeal to several senses at once. After the interrelations of the various qualities of experience have been learned—the correspondence of a visual patch of color with a certain felt shape, with a certain kinesthetically measured distance, with a certain felt texture, hardness, weight or temperature—we can then get the complex of these qualities *indirectly* through the mediation of any one of the senses involved.

Those who make much of the fact that only eyes and ears are capable of giving us finely distinct impressions are inadvertently, perhaps, crediting to those organs an apperceptive acuity which has in fact been derived partly, and in part uniquely, through touch. This fact is the more readily forgotten because we have given the same name in many cases to qualities mediated by more than one sense. Impressions of shape and size, for instance, are constructed from data received by either eye or hand; and to some extent this is true of texture as well. Yet whatever the source of the impression, the same name serves. Color, on the other hand, belongs to sight alone; while for the most part weight, temperature, solidity belong to touch alone. Those who hold that touch data are difficult if not impossible to order are referring to data received uniquely through touch, no doubt. But these, we have shown, unquestionably yield to ordering relationships.

The evidence is replete, then, that our tactile impressions resemble those of sight and hearing both in their capacity for organization on "natural" scales of perceived degrees of a quality and in their correspondence to certain structural relations in the object which may be measured with any desired degree of refinement.

Let us now return to the earlier question: whether widely accepted aesthetic

canons, such as Parker's unity in variety, dominance and equilibrium are or are not applicable to touch experiences.

To this writer it seems obvious—and it has been the unanimous report of those to whom inquiry has been made on the subject—that it is natural, meaningful and accurate to say that in experiencing an object through the sense of touch we experience organic wholes on the tactile level. Within the unified experience it is possible to discern elements of theme and thematic variation; of balance, symmetrical or otherwise; of rhythm; of dominance. Inasmuch as direct or indirect tactile experiences are part of the whole impressions received through all the arts (with the possible exception of music), what more to be expected than that our analysis of the structural principles underlying good art should not infrequently take account of them?

To put it another way, the so-called principles of aesthetic form are those structural elements by which it is possible to grasp perceptually the complex object through touch, just as through sight. The writer agrees with Harold Newton Lee, quoted above, in holding:

> Aesthetic form is the organization of perceptual materials according to those structural and qualitative relations which are given in immediate apprehension . . . Rhythm, proportion, balance . . . are structural elements . . . the objective factors in many of the situations in which beauty is experienced.

To summarize: tactile impressions exhibit principles of order, both in the sense of yielding clearly distinguishable and objectively measurable qualities analagous to those of sight and sound; and in the sense of being appropriately judged by the aesthetic canons applicable to all the arts.

VI. Consideration of the Philosophical Argument. There remains the most significant and telling objection of all—the view that touch data are incapable of expressing our larger and deeper life experiences. When all is said and done, what matter whether it is psychologically and technically possible to create and enjoy tactile art, if the experiences to which it gives rise are essentially shallow and unimportant?

Any branch of art, we legitimately feel, would be intrinsically superficial if it were limited in its appeal to the arousing of our appreciation of its "surface," "material" or "formal" beauty. The great masterpieces of any art formulate and quicken our deepest insights into life's promise and significance. Art has a vital and central role to play in real life. That part, we say, is to *express values.*

Even though there is less than full agreement among artists and aestheticians as to precisely what this phrase connotes, there is a wide-spread effort to give it concrete meaning. Hospers, in *Meaning and Truth in the Arts,* (p. 12) is explicit that it is one of the chief functions of art to express the larger life of feeling and thought:

> Only a small part of our enjoyment of the arts . . . consists in enjoyment of aesthetic surface or aesthetic form simply in themselves. Indeed our appreciation of works of art does not usually consist primarily of these at all . . . The sensuous surface . . . is to say the least, not predominant; and if the form is, it is employed chiefly as a vehicle for something beyond itself—something conveyed through the form and upon the aesthetic surface. This some-

thing comes from life, from the world of experience outside art, and for lack of a better term I shall call what is thus conveyed *life-values*.

This forthright statement goes somewhat beyond what many writers would be willing to assert, in its apparently unguarded opening of the door to "the world of experience outside art." A. R. Chandler, for example, in *Beauty and Human Nature* (pp. 12–13), is more cautious in his wording of the phrase, and inclined to point out qualifications as to its full place in aesthetic experience. After defining the typical aesthetic impression as having three characteristics: (1) *isolation* ("Aesthetic experience is complete in itself"); (2) *unity* ("Its parts all hang together;" "It should be impossible to add to it or subtract from it, or to change the relations among its parts, without impairing the effect"); and (3) *significance* ("The intuition usually expresses something which is important to us"); he adds:

Whether some degree of significance is indispensable may be left an open question for the present. At any rate, there is an extraordinary variation in the degree of significance.

And Bosanquet, quoted above, warns:

When the communication of the idea substitutes itself as a purpose for the need of expression in sensuous form, the limit of art is overstepped and . . . becomes didactic.

We may properly insist that art be not asked to take the place of science and morals in discovering and interpreting the meanings of life. Nevertheless we may hold that art is peculiarly fitted to express certain unique aspects of experience, and may inquire what these aspects are.

Parker, in his two illuminating chapters on the definition and the intrinsic value of art (*The Principles of Aesthetics*), brings together the ideas of many other writers on this subject in such phrases as these: The work of art should "produce an imaginative realization of tendencies which cannot find play in real life." It should "help us master our emotions, bring them into the light, order them in articulate form, receive assuagement and peace." It should "universalize and communicate feeling, socialize feeling, widen the scope of common life." It should "embrace the values of ideas which lie behind the form." And he summarizes these chapters, giving his own view, as follows (p. 42):

Art is expression, not of mere things or ideas, but of concrete experience with its values, for its own sake. It is experience held in a delightful, highly organized sensuous medium, and objectified there for communication and reflection. Its value is in the sympathetic mastery and preservation of life in the imagination.

Using such expressions as these, as at least partially satisfactory yardsticks, we must now inquire whether, when the sense of touch is called into play as the agent of aesthetic emotion, such meanings must inevitably fail to be involved.

Perusal of the literature reveals that modern writers on sculpture and its aesthetic principles find in plastic art—touchable art—large symbolic meanings, very far indeed from being limited to appreciation of surface or formal beauty. Valentiner, for example, quoted earlier for his emphasis on the importance of touch in creating and appreciating art, is concerned to point out the deep ex-

pressiveness of plastic art forms. He sees the abstract sculpture of our times as peculiarly fitted to convey our contemporary preoccupation with the "creative energies which initiate and sustain life." To quote him further:

> The sculptors of our time are interested in what was formerly called the lower forms of life, in animals like reptiles and fish which were among the first to inhabit the earth. Brancusi shows the beginning of organic life in his egg-shaped forms. Flannagan has created more than once the moment when life penetrated the shell of the egg and produced an animal out of the seemingly inorganic materials . . . In Henry Moore's art the human beings are developing from the first unconscious state of mind into reality, their transformation from earth to life being hardly completed; while Lipchitz' bodies appear as if they had just been created out of earth by God's hands, carrying with them still all the qualities of earth in their heavy massive shapes. The most characteristic expression of active life energy penetrating into the body and pressing violently through its veins is seen in the art of Gaston Lachaise.

Whether or not one agrees with Valentiner's analysis of the import and significance of much modern sculpture, the capacity of such art to express values is clearly assumed by him as too obvious to need comment or defense. And no one can follow the controversies which flourish among devotees of different schools of sculptural expression without admitting that the appropriateness of the medium to render deep life meanings is taken for granted by all. To defend the view that touch is impotent to deliver vital immediate insights into life-values, one must hold that it not permissible to use the hands in appreciating plastic art—a position which we have tried to show is indefensible, from any purely aesthetic standpoint.

One may speculate on the possibility that the opinion of Bosanquet (in which he follows Kant and others) that "the art of sculpture admits, compared with the other arts, of very little ideality, that is, of very little subtlety of variety of intellectual or emotional interpretation" arises from the comparatively late development, in our culture, of *abstract* sculpture.

European music and painting freed themselves of crude anthropomorphism earlier than the other arts, leaving sculpture far behind. But primitive sculpture, Egyptian sculpture, modern sculpture all speak to us through relatively abstract or stylized forms in which the symbolic meanings peculiarly expressible in plastic media may be clearly apprehended. The impression that through touch we cannot comprehend life-values may, then, derive partially from the fact that the works of art open to tactile appreciation were not themselves concerned with the expression of such values. Neither eye nor hand could extract from them what was not there.

If this is so, the movement of interest in modern sculpture away from the sheerly representative may well bring with it a quickened realization of the role which the touching hand may play, as well as the seeing eye, in appreciating values.

It should be clear from this discussion that in this writer's opinion it would partake of aesthetic artificiality to attempt to separate the contribution of the sense of touch from one's total reaction to a work of art. Tactile appreciation is not something to be cultivated as a tour de force, in isolation from other aesthetic stimuli with which it is associated naturally, as if it were necessary or

desirable to give constant evidence of its capacity to mediate aesthetic experience. Marcel Duchamps' experiments, for example, in creating plastic art forms which are to be enjoyed by thrusting one's hand inside a box to move over the form within, seem to be in the nature of a piano exercise, justifiable perhaps as a device for training the sense of touch to greater fineness of discrimination. It is not a promising approach to the creation of genuinely enjoyable tactile art, which, no more than drama or the dance, should be shorn of the accompaniments of those contributory arts which sharpen and intensify the whole aesthetic experience.

In whatever way eye and hand may cooperate in bringing us delight, each makes its unique contribution. What is it that touch uniquely contributes? One may only try to suggest in an evocative way what it is. To anyone to whom the avenues of aesthetic tactile pleasure are closed, the description is sure to remain verbal.

On the basis of introspection, then, extended by questioning of artists and those who live with art, as well as of the blind, one finds a remarkable concurrence of report that aesthetic tactile experiences are among the most *profoundly integrating* of any obtainable through art.

Perhaps because it is biologically the oldest sense, out of which the other senses have developed through the long ages, it seems psychologically easiest to achieve a sense of *restoration to simplicity*, of *unity*, through touch.

Through touch one participates imaginatively in the "sensations" of lower and simpler life forms—of ivy clinging to crevices and trees swaying in the wind; of sea-wrack swinging with the tide, and yellow verbena sprawling over the hot sand in the sun. Touch reweaves our ties with the early far-off things.

Contrary to Bosanquet's intellectualistic distinction, touch, even in its aspect as "dealing with mere heat and cold," can bring us an animistic sense of identity with the inanimate, as the cold polished stone or metal takes our own warmth and life, cools our thought-engendered fevers, calms and quiets us.

Touch gives us the "insides" of things. Many writers have noticed this. The careful analytical statement of H. H. Price deserves quotation (*Proceedings of the Aristotelian Society*, n.s. Vol. 44, "Touch and Organic Sensation"):

> A visible object, if you consider it as being merely visible, consists merely of outsides. If you call it "solid" you are using that word in a purely geometrical sense; you mean merely that a three-dimensional volume of space is completely surrounded by color expanses. Even if the object breaks into bits or is cut open, you still see nothing but new outsides . . . But the tangible object (i.e., the object revealed by muscular sensation and contact sensation combined) is actually experienced as having an inside . . . As Locke said, "If anyone asks me *what this solidity is*, I send him to his senses to inform him. Let him put a flint or a football between his hands and then endeavor to join them, and he will know."
>
> . . . it may . . . be true that although visual experience is more extensive, tactuo-muscular experience is more profound.[4]

[4] Price makes some enormously suggestive observations on the different types of causal theory developed by visual-minded as contrasted with tactuo-muscular-minded philosophers. If it is possibly true that atrophy of tactile experiences in certain philosophical thinkers has tended to produce reductive theories as to the character of fundamental world-processes, we should indeed have a dignified "case" for supporting art-forms which would cultivate these neglected powers and intuitions!

We have already quoted Helen Parkhurst as holding that touch is the *reality* sense *par excellence*; a view shared by psychologists who, in administering the Rohrschach tests, interpret the reaction of the person who responds to a visual surface in terms of felt textures—"it is rough," "it is like fur"—as being "in touch with reality."

The contention that touch is inherently unsuited to express the deeper values of life may indeed be a kind of rationalization after the fact. Possibly it is the *practical* functions of eyes and ears which have crowded touch to the wall in Western civilization and thus cut short the aesthetic career of this sense. Eyes and ears are supreme after all in practical living because they report conditions at a distance and thus permit time for adjustment of the organism short of actual (possibly harmful) contact. Such a function, while immensely useful, surely warrants no conclusions as to the intrinsic fitness of these organs, rather than the hands, to serve as agents of *aesthetic* response.

It is possible today to live on levels more and more distantly removed from the rich manifold of experience, substituting the symbolic gesture for the participating act throughout great areas of life. There are even strong practical advantages in so living. But can one believe that the texture of experience is made richer, thicker, warmer thereby? Those who dwell in a reductive aesthetic world—a world in which the joys of touch are given only indirectly, at second-hand, through sight—seem to this writer to inhabit an impoverished, an infra-real world.

It is now possible to answer briefly the question with which this inquiry began: whether there are sound aesthetic reasons for the meagreness of tactile art expression in Western cultures.

After this arraignment of the sense of touch before the bar of investigation and judgment, we charge that no sound case against the aesthetic fitness of the sense has been established by witnesses against it. Reasons which are aesthetically irrelevant, offshoots of practical, religious, or other strands of our cultural heritage seem to be responsible for our lamentable condition of poverty in tactile art.

In conclusion, one may note with satisfaction that the movement toward explicit recognition of the function of touch in aesthetic experience is already discernibly under way in Europe and America. It deserves to be encouraged by artists and public alike, as a healthy rounding-out and enrichment of aesthetic life, and enhancement of the value-expressiveness of art.

A METHOD FOR THE CREATION OF GEOMETRIC DESIGNS

EDWIN M. BLAKE*

The three geometries. Euclid, a professor at the University at Alexandria, about 300 B.C., collected the geometrical results of Greek study during the preceding three centuries and incorporated them into his celebrated "Elements" which is the basis of elementary instruction in geometry even unto the present day. After Euclid came Archimedes and Apollonius of Perga, who produced a systematic treatise on the conic sections. He died about 200 B.C., after which interest in geometry gradually declined, only to be again revived about the seventeenth century. In 1637, Descartes announced the discovery of analytical geometry, followed during the next half century by the calculus in two versions. One, by Newton, was discovered possibly by 1666, and the other was published in 1684 by Leibnitz. These two great analytical methods made possible the solution of a great many problems beyond the powers of Greek methods to effect. Greek geometry is characterized by being metric; its theorems relate to measurements and quantative comparisons of angles, lengths of lines, areas of surfaces, and volumes of solids.

The first deviation from the rigidity of metrical geometry developed early in the seventeenth century, by studies which eventually led to the publication by Jean Victor Poncelet in 1822 of a systematic work on the projective properties of figures; which is to say, those properties of a figure that are common to it and to all other figures obtained from it by projection. Projective geometry forms the basis of the theory of perspective.[1]

Topology, the third of the geometries to be considered, had its beginnings in some problems and theorems dating from the eighteenth century. One especially interesting theorem, due to Leonhard Euler, is "in any polyhedron the number of faces plus the number of vertices is two greater than the number of edges." For example, the cube has six faces and eight vertices, making fourteen. Hence, the number of edges is fourteen less two, which is correct. This is true also of any oblique parallelopiped. The theorem does not refer to the sizes of angles, lengths of lines, or areas of faces, but only to the numbers of structural elements present. It has been useful in classifying figures, structurally identical with the edges of polyhedra, termed "polyhedral subdivisions" in what follows. In 1847, the German mathematician, Johann Listing published a small pamphlet[2] which collected together and discussed what was then known of what he declared should be a new branch of geometry. It took a few

* A letter from Mr. Blake on the subject of Wilfred's clavilux was published in this *Journal* for March 1948, Vol. VI, No. 3, p. 265. It mentions some of Mr. Blake's other writings. (Ed.).

[1] For the above account of geometry the writer has depended on the well known work: *A Short Account of the History of Mathematics*, W. W. Rouse Ball, London, Macmillan & Co. Second edition, 1893.

[2] *Vorstudien zur Topologie.* An amusing account of topology with interesting examples is to be found in *Mathematics and Imagination* by Edward Kasner and James Newman, New York 1940, in chapter entitled: "Rubber-Sheet Geometry."

years for Listing's work to attract notice and become known, but then it aroused considerable interest, and topology has been actively investigated ever since.

Of the three geometries which our survey has mentioned, the metric geometry of the Greeks, which in its applications to design may well be called "the geometry of form," has dominated the teaching and practice of non-naturalistic decorative art from long ago to the present, and it would seem to be the basis of recent essays to create a corresponding fine art of painting. Projective geometry, although the basis of perspective, does not seem suited to furnish the foundation for any new method for the creation of designs. On the other hand, such portions of topology as are applicable, which may conveniently be called "the geometry of structure," give great promise of a new vision in non-naturalistic design. This is because a geometric figure is one form of an underlying structure capable of endless forms, thus the concept of structure achieves for geometric figures a flexibility not inferior to that of the human figure, animals and plants.

The arts whose subject matter is geometric. The method of design which derives its subject matter from geometry applies to plastics, graphics, grapho-plastics, and mobile graphics, in so far as these are decorative or fine art. Plastics includes modeling and sculpture, the forming of surfaces into three dimensional objects of art. Graphics includes drawing, painting, and etching executed on paper, canvas, or other plane surface, and such other simple surfaces as involve no problem of creating a plastic design, for example, the decoration of a standard type of plate, cup and saucer, or an egg for celebration of Easter. On the other hand, grapho-plastics is polychromatic sculpture, the creation of a plastic composition and then the decorating of it with a graphic design, harmonious in construction with the plastic which bears it. Mobile graphics means movies showing geometric designs which change size, orientation, form, structure and color as the composition proceeds. This can be done by the technique of the animated cartoon. There might be animated plastics and grapho-plastics, were mechanical means discovered for producing them. Forms on a stage, animated by men inside, might well be more ludicrous than artistic.

There are three varieties of graphics, depending on the depth represented perpendicular to the surface on which the composition is executed. A presentive drawing or painting shows no depth; it is not a picture of any object. It brings a conception or notion directly before the mind. A simple example is a piece of dress goods showing a polka dot pattern. Laminate drawings and paintings include knotted and braided patterns, such as those in Roman mosaics of the first and second centuries, much of Saracen ornament, and illumination of the Book of Kells and the Lindisfarne Gospels. The depth represented is slight, sufficient only to permit a cord or ribbon to pass over or under another. As to the proper designation for such works, neither "knotted" nor "interlaced", nor both together expresses the facts. Modern geometric paintings frequently show such features as a rectangle lying across another, or a triangle overlapping a circle. "Laminate" means a picture of an original consisting of some flat construction of pieces of sheet material overlapping one another, that is, a picture of a flat something composed of layers or laminae. Depictive graphics, the third variety, consists of still life drawings or paintings of geometric plastics

and grapho-plastics with possibly rugs, table covers, or hangings of blank or geometrically decorated fabrics. Such a work shows full perspective depth. There is a question as to what objects may be included. Pottery, opaque glass, plastic, and metal objects non-naturalistic in form and decoration, when interest is centered chiefly in design and decoration of the object, not on any utility it may have, may be included. Excluded should be buildings, machinery, musical instruments, tools and implements that are primarily utilitarian.

Naturalistic paintings and decoration can be depictive, exemplified by landscapes, interiors, and flower pictures, also laminate, when a decoration shows flat vines, leaves, and flowers. No naturalistic design can be presentive, its subject must be plant, animal, and human forms, or landscapes—all objects that must be depicted.

Surfaces. Without attempting to formulate a scientific definition of structure, its nature will be indicated by examples. The method under development employs two varieties of surfaces, fundamental and periodic. The fundamental surfaces are an endless series which, beginning with the simplest, have been named: ovoid, annuloid, triannuloid, tetrannuloid, pentannuloid, hexannuloid. . . . Each is non-singular, finite in extent, and closed. A piece of modeling clay can be shaped like a long cigar, sharp pointed at each end. It can then be bent into a ring-like shape, the sharp pointed ends being brought together so that they touch, but at one point only, that point is a singular point of the surface. Again, a piece of modeling clay can be shaped like a cigar, each end brought to a sharp, straight, chisel-like edge, say one inch long. Next bend the clay into a ring-like surface, bringing the two edges together so they just touch along a straight line one inch long, that line is a singular line of the surface. Both the fundamental and periodic surfaces are "non-singular," meaning they have neither singular points nor singular lines. Although one, perforce, has usually to construct models of surfaces of wood, plaster, or modeling clay, it is only the outer surface of any such model that comes under the designation "surface"; models are assumed to be hollow. Each fundamental surface divides all of space into two parts, an inner part which is finite, and the remainder of space which is infinite.

Every fundamental surface is a plastic "structure" which has no definite "form," but each is capable of being shown in an endless number of forms. Specific forms of the first five fundamental surfaces are shown in Fig. A. Each fundamental surface is distinguished from every other by the number of openings or passageways through it. An ovoid has no opening through it, an annuloid has one, a triannuloid two, a tetrannuloid three, and so on. An ovoid is exemplified by the surface of a sphere, an egg, a cylinder, cone, tetrahedron, cube, or any irregular surface such as a piece of stone, or some gourds with their many excrescences. An annuloid is a ring, the annulus being its most regular form; a tea cup and a pitcher are examples. The third model in Fig. A is a form of triannuloid, other forms being shown in Figs. B, C. Other examples are cups and vases with two handles.

It may be objected that the sphere and cube are quite different surfaces. The sphere is a single unbroken surface, while the cube is bounded by six squares,

each a portion of a plane. That is quite correct if one is speaking of form, but as to structure, both are ovoids according to definition given above.

The second variety of surfaces employed in this method of design, the periodic, repeat periodically in one or in two directions, either as to structure, form, carried graphic pattern, or as to any two or all three of these. Periodic surfaces include the planoid, cylindroid, ribbon, and many others. The simplest form of planoid is a plane, and an embossed metal ceiling is an example of a planoid having a doubly periodic form. A cylindroid is illustrated by a stone column into which is carved a design, that repeats lengthwise of the column and may repeat cyclically about it. A woven strip, known as a ribbon and figured, is an example of the surface termed a "ribbon."

Both the fundamental and periodic surfaces admit of structural modifications which greatly enhance their usefulness. In order to understand and demonstrate these modifications, it is necessary to assume the surfaces have certain properties. Surfaces are assumed to be opaque, capable of being bent without breaking, stretched to any extent without tearing, shrunk without buckling, also if cut and the edges of the cut separated, those edges if subsequently brought together will join and adhere without leaving a mark. The cut edges of two different surfaces when brought into contact will adhere, which is employed in building up more complicated surfaces by the union of two or more simpler ones.

Eyeleting is one of these structural modifications. It consists in cutting an eyelet, a very small hole, in the surface. If the surface is an ovoid, say of spherical shape, the edge of the eyelet may be stretched until a bowl-shaped surface results which may be flattened into a disc, and finally, if desired, stretched into a plane rectangle. The surfaces obtained since opening the eyelet are singly eyeleted ovoids. Any number of eyelets may be opened in an ovoid or in any other fundamental surface. The exterior surface of a vase, from the edge of its base to the top of its neck, is a doubly eyeleted ovoid. The exterior surface of a pitcher and its handle, exclusive of its base and interior, is a doubly eyeleted annuloid.

Two eyelets cut in any fundamental surface, may be so located and their edges so shaped as to leave a narrow portion of the surface, or strap, between them. This can be cut across and one part twisted one or more full turns, and the edges rejoined. Thus has a strap twist been introduced. A strap may be stretched, cut across, and a knot tied in one part, then rejoined, resulting in a strap knot. Any tubular part of an annuloid, triannuloid, of higher fundamental surface may be cut across, provided the cut does not separate the surface into two parts, an axial twist of one or more complete turns introduced on one side of the cut and the edges rejoined, thus introducing a tubular twist. If the surface is blank, it will appear as before, but a line, band, or other design running along the tube will be given one or more turns about it. A tube may be stretched, cut across, and the part of the tube on one side of the cut knotted and the edges rejoined, resulting in a tubular knot. Fig. D shows a knot of five crossings in an annuloid. A triannuloid of form shown in Fig. B may receive three knots, one on each tube. Two or more fundamental surfaces may be linked together. An annuloid and triannuloid may be linked by cutting across the annuloid,

separating the edges of the cut, placing the annuloid around a tube of the triannuloid, and rejoining the edges. A triannuloid, like Fig. B, having a knot in each tube, can have each knot linked to the other two, arm in arm as it were, by the same process. Linking may also be accomplished by cutting across straps.

In making the above described surfaces the basis of sculpture, the writer does not believe opacity and the exclusion of surfaces having singular points and lines seriously restricts freedom of design. The available surfaces are simpler and fewer, resulting in concentration of effort in a less wide field. On the other hand, in depictive mobile graphics, certain interesting continuous changes of structure can be effected by passing through surfaces having one or more singular points or lines. In general it may be said, the conditions imposed on this method of design are no more restrictive of the creative imagination than are the rules of musical composition in that field.

The problem of sculpture consists, first, in selecting a plastic structure, a fundamental surface, structurally modified as above described, if desired, or two or more such surfaces standing side by side or linked together; second, in changing the form of the selected plastic structure until a satisfactory form results. To assist the sculptor, he should have a clear idea of the several principal forms of surfaces that geometers have studied, described, and classified. Among these are the plane, several forms of cylindrical and conical surfaces, the sphere, ellipsoids and other conicoids, and surfaces of revolution. To take a simple example, an ovoid may take the form of a right circular cylinder, which is bounded by two plane circular discs and a curved lateral surface, which is a length cut from a right circular cylindrical surface. The cylinder, instead of having a flat top, may be terminated by a cone, or hemisphere. Many different elementary forms of surfaces may be combined to achieve the final form of the selected plastic structure, completing the desired plastic composition.

Ovoidal, annuloidal, and higher graphics. Line figures, as employed in presentive graphics, are, in theory, always drawn on fundamental surfaces. If these are later to be modified by eyeleting, twisting, or knotting the figures are carried along on the surface. In practice, it is often more convenient to draw on a plane. Any figure that can be drawn on an ovoid is ovoidal. Every ovoidal figure can be drawn on an annuloid, triannuloid, or on any other higher fundamental surface, and it can be placed in any domain of any figure that may already be on that surface.

Two kinds of figures can be drawn on an annuloid, ovoidal, as just stated, and annuloidal. An annuloidal figure cannot be drawn on an ovoid, but can be drawn on a blank triannuloid, or on any higher fundamental surface. If the higher fundamental surface has a line figure already on it, which is not ovoidal, the two may conflict by crossing of lines. Only one annuloidal figure can be drawn on an annuloid without conflict. To illustrate the simplest kind of annuloidal figure, select an annulus, draw a circle running lengthwise about it, and through a point P on this circle, draw a second circle which passes transversely about the annulus. This figure can neither be drawn on an ovoid nor on a plane. Similarly, on each fundamental surface line figures can be drawn "that pertain to it." For example, any pentannuloidal figure can be drawn on a blank pentannuloid, hexannuloid, or higher fundamental surface, but not on a

tetrannuloid, triannuloid, annuloid, nor ovoid. Thus are line figures divided into mutually exclusive categories. A line figure, defining a graphic structure, is the basis of a design; lines are given pleasing forms and proportions, and color, either isotonic or varitonic, applied to the several domains.

An interesting question suggests itself, which of these several kinds of line figures have actually been employed in presentive, decorative and fine art? All plates, saucers, bowls, vases without handles, lamp shades, buttons, backs of playing cards, and rectangles of paper and canvas on which one draws and paints, can employ only ovoidal graphics. Cups, pitchers, and vases with one handle can be decorated with either ovoidal or annuloidal graphics, but the writer does not recall ever having seen any annuloidal design used. Such a design on a pitcher would have to go around its body, and around and along its handle. On cups and vases having two, three, or more handles, triannuloidal or higher graphics could be used, but it would seem only ovoidal ever has been.

The above paragraph does not, however, tell the whole story. Presentive doubly periodic designs drawn on a plane, may be conveniently classified into three structural kinds. Insular, exemplified by the polka dot pattern, consists of small isolated figures placed on the plane, islands, as it were. Striped, exemplified during recent years by many men's necktie silks, classified by the lines and kinds of periodic figures that separate the stripes. Netted, exemplified by floors covered with square, hexagonal, or square and octagonal tiles. These last are closely related to annuloidal figures on an annuloid, which for simplicity will be assumed to be in the form of an annulus. Make a cut across the annulus and bend it into a straight circular tube. Make a cut in this from end to end and flatten the result into a rectangle. Make many replicas of this rectangle and place them side by side to cover a plane. The sides and ends will match, and a netted pattern covering the plane will result without any breaks in it. One may reverse this procedure. From a plane having a netted design on it cut a rectangle, say four repeats wide and ten long, roll it into a tube, bend the tube into an annuloid, and the result is an annuloidal figure which repeats four times transversely and ten times longitudinally about the annuloid. It is much easier to draw and study doubly periodic netted line figures on a plane, and transfer such results to annuloids as may be required, than to reverse the process, although in theory, all annuloidal line figures originate on annuloids.

All line figures on ribbons, all insular and striped line figures on both cylindrical surfaces and planes are from ovoidal figures. All netted figures in the plane, as just explained, are from annuloids, as are also netted figures on cylindrical surfaces. The latter are obtained by cutting a strip, one or more repeats wide, from a netted figure on a plane, and rolling the strip into a cylinder. This and the preceding two paragraphs are a complete statement, as far as the writer is aware, of the sources of line figures thus far employed in geometric presentive design.

Triannuloidal, tetrannuloidal, and higher line figures differ in many respects from ovoidal and annuloidal. These higher figures bear some family resemblance to one another, but the tetrannuloidal exhibit more varieties than the triannuloidal, the pentannuloidal more varieties than the tetrannuloidal, and so on.

Handsomely decorated plates and bowls, shapely vases with or without

handles, decorated or not, statuettes and pottery figurines have been produced, through the years, to grace our houses and enrich the museums. Would it not be well if other examples of geometric plastics and grapho-plastics were now produced to vie with plates, vases, and figurines—perchance exhibiting triannuloidal and higher graphics?

Elements of graphic structure. The structural elements which constitute line figures are lines, points, and domains (areas bounded by lines) of several varieties. Lines are of three kinds: biterminals, aterminals, and uniterminals. *Plate I*, Figs. 1a-i, 4a-e show forms of isolated biterminals, each of which has two end points. Figs. 5 and 6 are constructed of biterminals. In Fig. 5, AC and CB are finial biterminals, each having one end point, the other terminal being the junction C. Biterminals DC and DE are connecting biterminals, because if either were removed, the figure would fall into two parts; also they are unidomanial, meaning the same domain lies on both sides of them. DC connects the junctions D and C. Fig. 6 is composed of six bidomanial biterminals, each connects two junctions and lies between two different domains. ADB is one bidomanial biterminal, not two; D is simply a formal feature, a point where the direction of the biterminal changes. Fig. 7 is composed of four finial and four bidomanial biterminals. An aterminal, which is a line without any end, is illustrated in each of Figs. 8a-e, 9–12. On the ovoid they are bidomanial, on the annuloid and higher fundamental surfaces, they may be either unidomanial or bidomanial.[3] Fig. 13 consists of two uniterminals, the circle on the left and the rectangle on the right, joined by the connecting biterminal AB. The one terminal of the circular aterminal is the junction A. The rectangle BCDEFB is a uniterminal whose one terminal is the junction B. The angles C,D,E,F are formal, not structural, features. Figs. 14, 15 are each composed of two uniterminals joined at a junction, and Fig. 16 of three. Fig. 17 has a uniterminal above and below, joined by three bidomanial biterminals. It is of interest to note that a biterminal may stand alone or be joined to other biterminals or uniterminals; an aterminal must stand alone, no other lines may be attached to it; and a uniterminal must have one or more lines attached to it.

Points that serve as structural elements are end points and junctions, the former being illustrated by A and B in Fig. 1a, and A,B,F in Fig. 5. Junctions are points where three or more lines meet, the number of which is the order of the junction, the count being made close to the junction. In Fig. 5, C and E, in Fig. 13, A and B are of order three. Junction D in Fig. 5 and the junctions in Figs. 14, 15 are of order four; A,B,C in Fig. 6 are of order five; and the junction in Fig. 16 is of order six. The directions the lines take as they leave a junction is a matter of form, not of structure.

Domains are areas bounded by lines, and it is on their structural characteristics and relations that the classification of presentive ovoidal lines figures, with respect to their structures, is based. A subdivision is either a single line, such as Plate I, Figs. 4c, 8d, 12, or a figure consisting of several lines attached to one

[3] It may be objected that Figs. 8b, c are each composed of the arcs of three circles, and Fig. 8d of three straight lines, each is not one line but three. Quite true if one refers to form, but each is a closed circuit, which is what "aterminal" means.

another, such as Figs. 5, 6, 7, 13–18. *Plate II* is the key to the classification; under groups A,B,C are placed subdivisions, and under Group D are figures consisting of two or more subdivisions from any one, two, or all three of Groups A, B, C. Subdivisions of Group A contain neither multi-adjacent nor self-adjacent domains, and include the aterminal, Figs. 1, 2, the bundle of three biterminals, Figs. 3, 4, and polyhedral subdivisions, Figs. 5–9. Subdivisions of Group B have some pairs of multi-adjacent domains but no self-adjacent domains. Two domains are multi-adjacent when adjacent to one another in more than one way, thus in Fig. 12, domains b and d are adjacent at four junctions, and b and d in Fig. 13 along two biterminals. Bundles of four or more biterminals occur in Group B, see Figs. 10, 11. Subdivisions of Group C contain self-adjacent domains, and may or may not contain multi-adjacent domains. The isolated biterminal, Fig. 15, has only one domain, that which surrounds it, along which the domain is self-adjacent. The domain which surrounds Fig. 16 is self-adjacent at the one junction of the subdivision, as are domains d and e in Plate I, Fig. 15. With the exception of the aterminal in Group A, all subdivisions of Groups A and B are composed of bidomanial biterminals only, as are also many varieties of subdivisions in Group C, such as Figs. 19, 23. The isolated biterminal belongs to Group C, and other of its subdivisions contain finial and connecting biterminals, and uniterminals, all of which result in self-adjacency.

Subdivisions of Group A have their parts most closely knit together, those of Group B less so, and still less so those of Group C. Finally, figures of Group D have parts (subdivisions) not connected at all. With few exceptions, subdivisions of Groups B and C, and figures of Group D, are built up from subdivisions of Group A, especially from the endless array of polyhedral subdivisions. On this account it is important that a designer have at hand a well classified and indexed collection of polyhedral subdivisions, both that he may use any of them, and to exemplify the kinds and varieties that exist, that others may be constructed, if required. The writer has made such a collection consisting of about ninety plates containing about 1220 structural distinct examples.

Plate P-I, the first of the collection, contains all polyhedral subdivisions that exist, which are composed of not more than thirteen biterminals each. The least number of biterminals is six, Fig. 1, none has seven, one has eight, Fig. 2, two have nine, Figs. 3, 4. The number of biterminals in a subdivision is a measure of its complexity. The larger number of subdivisions in the collection have fewer than seventy-five biterminals each, although one has 540. It is possible to give Fig. 1 a very complicated form by making each line much broken, curved and contorted, in spite of structural simplicity. Nearly all figures of the collection are drawn with straight lines to show as simple a form as possible, but the designer is at liberty to elaborate form to any extent desired.

Every polyhedron is a form of ovoid, a cube of white plaster being an example. If the twelve edges of the cube are marked by black lines, the result is a polyhedral subdivision. Polyhedral subdivisions are structurally identical with the edges of polyhedra. In order to draw a polyhedral subdivision on a plane (piece of paper) it is necessary to eyelet the ovoid at some one particular point, enlarge the eyelet and flatten to a plane disc. In the drawing, the edge of the eyelet

should be indicated by a dotted circle or rectangle enclosing the whole. The edges have been omitted from Plate P-I for simplicity, text calling attention to the omission. The cube, when the eyelet is in a domain, yields Fig. 21. When eyeleted at a junction, Fig. 21a results, the edge of the eyelet passing through the ends of the three projecting lines. Fig. 21b is the result of eyeleting on a line. All domains of the cube are like situated with respect to each other, likewise all its junctions, and biterminals. This is not the case with Fig. 27, for example, which has seven domains, eight junctions, and thirteen biterminals. It will yield twenty-eight different figures, by opening the eyelet in all possible positions.

Polyhedral subdivisions are classified in various ways, according to the number of their biterminals, the number and positions of their axes of symmetry and the poles about which there is cyclic repetition. Plate P-I, Figs. 11, 12, 27, have neither axes nor poles, whereas Figs. 1, 6, 21, 22 are highly organized. There are subdivisions whose domains are all of order three, Figs. 1, 4, 22, or of order four, Fig. 21, or of order five, or of mixed orders, three and four as in Figs. 3, 5, 7, 41, 42, and similarly for junctions. Then there is the interesting fact of the least number of contrasting colors, required to color isotonically the domains of a polyhedral subdivision so that no line shall have the same color on both sides. A domain is isotonically colored when the color at each point is the same as at every other point. Plate P-I, Fig. 22a requires two colors. The domain lying between the outer lines of the subdivision and the edge of the eyelet must be colored; on the uneyeleted ovoid it is like any of the other domains. Three colors, call them a, b, c, are required for Figs. 4a, 4b, 7a, 7b, 9a, 9b, 13a, 13b. Four colors are required for Fig. 1 and Fig. 8 which permits the colors being arranged in three different ways, as shown in Figs. 8a–c. This brings us to the celebrated map coloring problem, not yet solved after study by some of the best mathematical minds since 1879. It is easily proved, five colors or less will color the domains of any subdivision, but no one has been able to draw a figure requiring five, or to prove that four will always suffice. There are figures on the annuloid requiring seven colors, and on the triannuloid requiring eight, indicating one essential difference in design on the three surfaces.

It would be possible to continue Plate P-I by determining all polyhedral subdivisions having fourteen biterminals each, and then fifteen biterminals, but soon the work would meet great practical difficulties of three kinds. First, it would become very laborious, owing to the great number of figures to be constructed and examined. Second, half or more of the subdivisions would be of lesser interest for design, being without axes of symmetry and poles. Third, a million or more subdivisions would be found before the thirty edges of the regular dodecahedron and icosahedron would be reached, the first of the subdivisions to have, respectively, only domains and only junctions of order five or higher. So a selection had to be made to illustrate kinds and varieties.

It has been shown that doubly periodic designs on a plane, when either insular or striped, are derived from ovoidal figures, but netted designs are obtained from annuloidal, more readily studied as nets on a plane. These can be classified much as are ovoidal subdivisions. Nets are polyhedral when containing neither multi-adjacent nor self-adjacent domains, and other varieties of nets are modifications

of these. The writer has developed a collection of 1005 polyhedral nets or meshes of the most important kinds and varieties.[4]

Plate M-I shows eighteen of the simplest, beginning with the square or checkerboard mesh, which has two biterminals in each repeat, followed by the hexagonal and triangular meshes which have three. Only one has four biterminals in its repeat, ten meshes have five, and twelve have six, only four shown on this plate. Some meshes in the collection have thirty biterminals in the repeat. All meshes having not more than eight biterminals have been included, 198 of them. Multi-adjacent and self-adjacent domains are readily introduced, and any ovoidal figure may be drawn in any of the domains.

Plane graphic form. Form in the plane will alone be discussed, but after that is mastered, the application to curved surfaces is not difficult. Elementary line forms in the plane are: (1) straight lines, (2) arcs of circles, and (3) elementary curves along which curvature continuously diminishes from one end to the other. Throwing a plane presentive graphic structure into a specific form consists in making each line take the form of a single elementary line, or of a broken line consisting of a succession of two or more elementary line forms joined end to end. Elementary curves can be constructed of any size from book illustrations to wall charts, and with extreme accuracy. It is intended that they should serve the designer, much as do plaster casts and the living models of the life class, to train hand and eye in the niceties of continuously varying curvature, so that skill is acquired in drawing curves freehand. In addition it is necessary to consider the directions which the three or more lines, which run from each junction, take. For example, the four, three, and six directions at each junction in Plate M-I Figs. 1S, 2F, 2G respectively, are at equal angles to one another, but in Plate I, Fig. 6, two of the five directions issuing from junction A go to the right, two to the left, and one downward. The nature of the points, where one elementary line form joins the next, are of importance. The forms of domains and their sizes, the lengths of lines, the orientation of subdivisions and their relations should also claim the attention of the designer.

It is sometimes surprising into what elaborate forms structurally simple patterns will be thrown. At first glance, it would not seem Fig. E could be a form of the square mesh, Plate M-I, Fig. 1S.

Every ovoidal subdivision and every doubly periodic netted plane pattern has a structural mode of arrangement; that is to say, it has or has not axes of structural symmetry and poles (points) about which there is cyclic repetition of structural elements. Every form of a subdivision or netted pattern has a formal mode of arrangement, which is either the same as the structural mode, or certain axes or poles are lacking in the formal mode that are present in the structural mode, or poles though present have their orders reduced. For example, Plate P-I, Fig. 2, has a pole of order four at its center and four axes of symmetry pass through it, the structural and formal modes being the same. No change of form ever changes the structural mode, but changes of form may, and usually do, effect changes of the formal mode. Thus, if the biterminal on the right of Fig. 2

[4] A mesh is a small sample of a net, whether the net be plane or cylindrical.

is changed in form from a straight line to a semi-circle convex outward, there will no longer be, as to form, a central pole, and only the horizontal axis through the junction of order four will remain. If both right and left biterminals become semi-circles, the center would be a formal pole of order two, and through it would pass a horizontal and a vertical axis of formal symmetry. The square mesh, Plate M-I, Fig. 1S and Fig. E, have the same structural mode of arrangement, but the formal mode of the latter is simpler. At most, the formal mode of arrangement can only have the axes of symmetry and the poles that are present in the structural mode. Plate P-I, Fig. 28 has no axes of structural symmetry nor any pole about which there is cyclic repetition of structural elements; consequently, it is impossible to throw that figure into any form which will be symmetric or that cyclically repeats about a pole.

Laminate graphics. Although laminate graphics can be placed on any surface, it will suffice to discuss it drawn on a plane. A plane laminate graphic design is a picture of a thin flat construction of tubes or sheets of surface, laid on a plane surface and viewed from a point above. The resulting picture, showing very little depth perpendicular to the paper on which it is drawn, should indicate clearly parts that are above or below others. The essential problem of creating laminate graphics is the design of the flat construction that is the original.

Although it is possible, and might at times be desirable, to combine cords or tubelike surfaces with flat straps or ribbons, such combination will not be considered here. There is no reason why the tubular surfaces and ribbons employed in flat constructions should not be decorated with presentive graphics, or even with laminate graphics.[5] An example of the latter would be a picture of a braid of three ribbons, and on each ribbon a laminate design representing a braid of four ribbons.

It is convenient to classify flat constructions and laminate graphics resulting from them into three kinds. First, aperiodic, which is to say, those that contain no periodic repetition, and consequently, occupy a restricted part of a plane such as the interior of a service plate, or the back of a playing card. Aperiodic designs may cyclically repeat about a pole. Second, singly periodic designs which occupy a strip of a plane, or what has been defined as a ribbon. A flat braid of five ribbons drawn on a ribbon is an example. Third, there are doubly periodic compositions which spread out over the plane in all directions by endless repetition. The picture of a chair seat woven of cane is an example, and others show annuloids linked together after the manner of chain mail.

The flat original of a laminate graphic design may be a single surface or two or more, in the latter case resting side by side, if each overlaps itself, overlapping linked, or interlocked. Linked means like the links of a chain, and interlocked is illustrated by three annuloids attached together, but no two linked. Flattened ovoids can neither be knotted nor linked together, but in the form of long rods they have some design possibilities. Knotted annuloids have been frequently used, Fig. D if flattened, and Fig. F an example showing six knots all alike in an

[5] Examples of the former are present in many mosaic floor designs, see G. B. de Rossi, *Mosaici cristiani . . . chiesa de Roma*, 1877–99; A. Terzi, *La Capella di S. Pietro*, Palermo 1889.

annuloid.[6] Mathematical literature provides drawings of several hundred knots in an annuloid, including all annular knots from the simplest, which has three crossings, to and including those having eleven crossings. The last probably as complicated as most designs would require, when one remembers, as in Fig. F, several knots of one or more kinds can be made in an annuloid, and by cutting across the annuloid two knots can be linked together, the edges of the cut being afterwards joined.[7]

In 1833 the German mathematician Gauss suggested knots as a subject worthy of study, and the paper by Listing, 1847, previously referred to, treats knots briefly. But it was only about 1875 that Prof. P. G. Tait of Edinburgh began a serious study of them, assisted by the Rev. Thomas P. Kirkman, and later the study was taken up by Prof. C. N. Little of Nebraska State University, terminating in 1899, after the search has been carried as far as it was practical or of interest to carry it.[8]

A triannuloid is much more polyplastic than an annuloid, a tetrannuloid much more so than a triannuloid, and so on. A triannuloid like Fig. B can be stretched out and braided like Fig. C, and it has three tubes in each of which one or more knots can be tied, and they can be linked together. An hexannuloid can have one or more knots tied in each of its six tubes. Any of the above can be flattened to make originals for graphic designs. Fig. G is an aperiodic laminate design employing a triply eyeleted ovoid; when tubular it is a triannuloid.[9]

[6] Replica, Shrine of Lough Erne, Irish XI century. Metropolitan Museum of Art, New York.

[7] "Alternate" means that following the annuloid, it alternately goes over and under other parts of itself. "Non-alternate" knots have two or more successive overs or unders. Their flattened forms are the same as the alternate, for which reason they might be rejected from this method of design, although it is not so clear, that they might not be employed in plastic designs in space.

[8] Principal papers by Tait: *Proc. Roy. Soc.* Edinburgh, Vol. IX, 1876–77, pp. 321–332; 391–392. *Trans. Roy. Soc.* Edinburgh, Vol. XXVIII, 1877, pp. 145–190. Plates XV, XVI; Vol. XXXII, 1884, pp. 327–342, Plate XLIV; pp. 493–506, Plates LXXIX, LXXX, LXXXI. Kirkman: *Trans. Roy. Soc. Edinburgh*, Vol. XXXII, 1884, pp. 281–309, Plates XL–XLIII; pp. 483–491.
Little: *Trans. Connecticut Academy*, Vol. VII, pp. 27–43, Plates I–VII; *Trans. Roy. Soc. Edinburgh*, Vol. XXXV, 1889, pp. 663–664, one plate; Vol. XXXVI, 1890, pp. 253–255, Plates I, II; Vol. XXXIX, 1899, pp. 771–778, Plates I–III. The value of these papers for the designer is in the illustrations and plates.

[9] Moscow, *Musée d'Art et d'Industrie, Histoire d'Ornament Russe du X au XVI siècle*, 2 vols. folio, Paris 1870. Vol. II, Plate XXXIX, XIV century. This work contains many other interesting laminate designs. In addition to this and references in footnote 5, the following show many examples of laminate graphics, and carvings in low relief which can serve as originals. Arthur Bolton, *Examples of Mosaic Pavings*, London, 1891. Arne Dehli, *Selections of Byzantine Ornament*, 2 vols. New York, 1890. Arne Dehli, *Norman Monuments of Palermo and Environs*, Boston 1892. Charles Errard & Al. Gayet, *L'Art Byzantin*, 3 vols. Paris. G. G. Gagarin, *Recueil d'Ornements byzantins et russes anciens*, 1887. Jules Bourgoin, *Precis de l'Art arabe . . .*, 4 parts, Paris 1892. F. M. Hessemer, *Arabische und Alt-Italienische Bau-Verzierungen*, Berlin 1842. J. C. Murphy, *Arabian Antiquities of Spain*, 3 parts, London 1813. Sir Edward Sullivan, *The Book of Kells*, second edition, London 1920. E. G. Millar, *The Lindisfarne Gospels*, British Museum, London 1923. J. Romilly Allen, *Early Christian Monuments of Scotland*, Society of Antiquaries of

Geometric structure. The concept of structure, which is basic for the method under discussion, permits freedom of form equaling, if not exceeding, that of plants and animals. It should serve to dispel the idea that geometric forms and designs are simple, inflexible, and barbaric; also to indicate the inexhaustible extent and variety of forms available to the designer and included within what the term "geometric" covers. The classification of figures according to their structures, instead of according to specific forms, is economical of kinds and varieties. Structurally all lines are biterminals, uniterminals, or aterminals. How many forms of aterminals are there, for example, including those of Plate I, Figs. 8a–e, 9–12? Structures are discrete entities, but forms differ one from another by imperceptible variations. Not only is structure basic to the creation of designs but to their appreciation as well. One who has acquired the structural point of view will look below form to the underlying structure, its particular kind and variety, the recognition of which is an important component of one's reaction to a composition.

Line figures, in so far as concern their structures, are initially drawn on fundamental surfaces, which it is usually then necessary to eyelet in order to fit them to the particular surface they are to decorate, after which form is studied and decided on. This idea serves to limit the kinds and varieties of graphic structures. For example, an ovoidal graphic structure without eyeleting the ovoid on which it is drawn, is ready for use on an Easter egg. Eyeleting the ovoid once, fits the structure to be drawn on a piece of paper or painted on a rectangle of canvas, or for design of a plate, interior of a bowl, a button, or playing card back. Two eyelets in the ovoid makes a surface that can be applied to the outside of a bowl, vase, or napkin ring. The one structure on the ovoid thus serves many purposes, but that is not all. Depending on the complexity of the line figure, a single eyelet may be located in from a very few to a great many different positions relative to the line figure, thus providing corresponding number of designs for the interior of a bowl or like service. They may not all be equally good; many will lack axes of symmetry and poles about which there is cyclical repetition, but much depends on the effect desired. The number of positions two eyelets can simultaneously take is much greater than the positions of one. All of this results in economy in the classification of line structures.

Scotland, Edinburgh 1903, 3 parts in 2 Vols. J. Romilly Allen, *Celtic Art in Pagan and Christian Times*, Philadelphia 1904, Chaps. VI–VIII. John Stuart, *Sculptured Stones of Scotland*, Vol. I, 1856; Vol. II, 1867. Henry S. Crawford, *Handbook of Carved Ornament from Irish Monuments of the Christian Period*, Dublin 1926. J. G. Cumming, *Runic and other Monumental Remains of the Isle of Man*, London 1857. K. Mohrmann & Ferd. Eichwede, *Germanische Frühkunst*, 2 parts, Leipzig 1906–07. Joseph Cundall, *Ornamental Art applied to Ancient and Modern Bookbinding*, London 1848. B. Quaritch, *A Collection of Facsimiles from Examples of Historic or Artistic Book-Binding*, London 1889. Theodor Gottlieb, *Bucheinbände*, K. K. Hofbibliothek, Vienna 1910, folio. *Les plus belles Reliures de la Réunion des Bibliothèques Nationales*, Paris 1929. Bibliothèque Nationale, Paris.

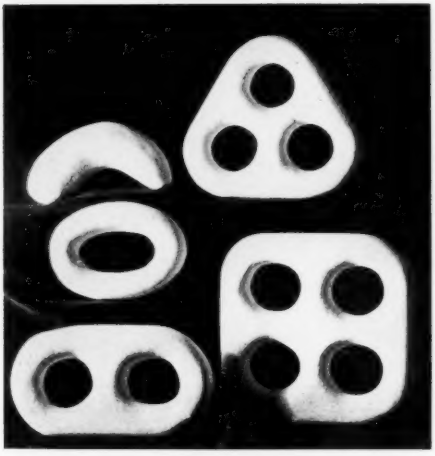

FIG. A

FIG. D

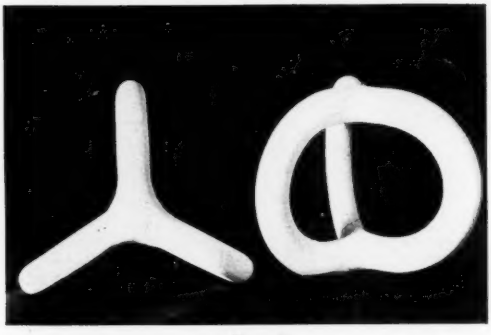

FIG. B

FIG. C

FIG. A. Ovoid, Annuloid, Triannuloid, Tetrannuloid and Pentannuloid (Models by E. M. Blake).
FIG. B. Two views of a triannuloid (Model by E. M. Blake).
FIG. C. Braided triannuloid (Model by E. M. Blake).
FIG. D. Annuloid having knot of five crossings (Model by Blake).

FIG. E

FIG. G

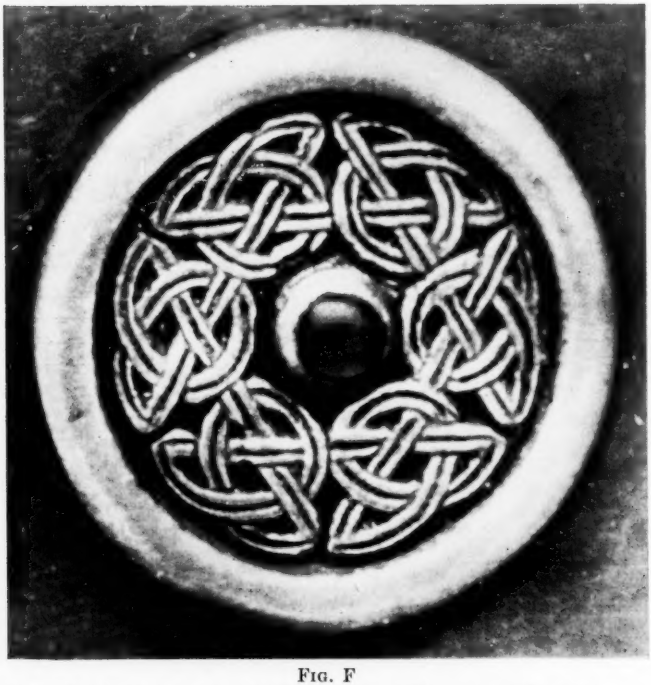

FIG. F

FIG. E. Textile showing a form of square mesh. (Chinese swastika fret).
FIG. F. Annuloid bearing six knots. Shrine of Lough Erne. Irish, XI century. (Detail.)
FIG. G. Interlaced triply eyeleted ovoid. Russian Ornament, XIV century.

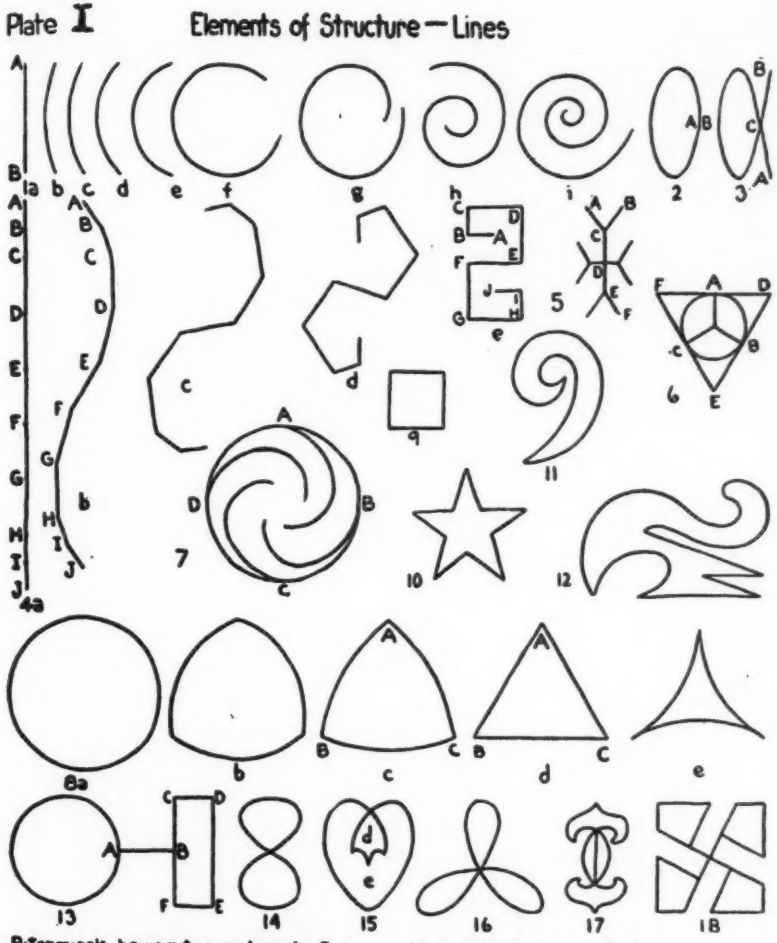
Plate I
Elements of Structure — Lines
Biterminals having two end points Figs 1a-1, Figs 4a-e
Biterminals having one end point and Biterminals connecting two junctions Figs 5,6,7
Aterminals, Figs 8a-e, 9-12
Uniterminals, Figs 13-18

PLATE I. ELEMENTS OF STRUCTURE—LINES

Plate II Ovoidal Line Figures
Group A – No multi-adjacent nor self-adjacent domains
Figs. 1,2 – Aterminals; Figs. 3,4 – Bundles of three biterminals
Figs. 5 to 9 – Polyhedral Subdivisions
Group B – Some multi-adjacent but no self-adjacent domains
Bundles of four (Fig. 10) &
of five (Fig. 11) biterminals
Group C – Some self-adjacent domains Figs. 15-20 rank zero
Group D – Two or more subdivisions

PLATE II. OVOIDAL LINE FIGURES

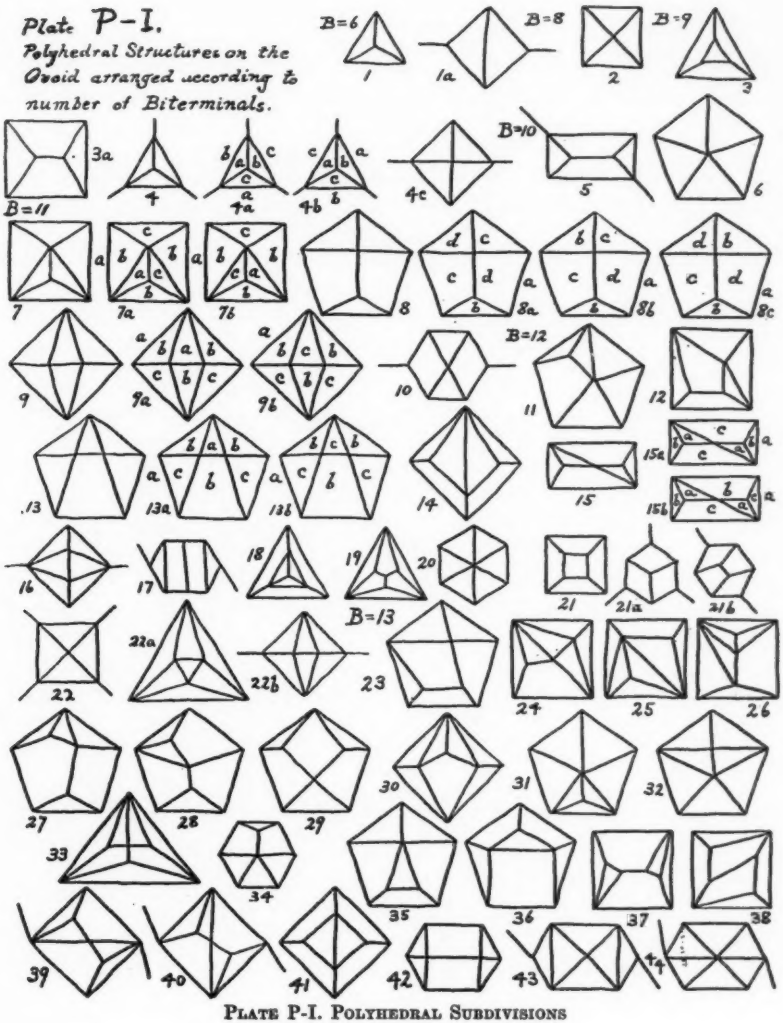

PLATE P-I. POLYHEDRAL SUBDIVISIONS

Plate M-I Polyhedral Meshes

Arranged according to B, the number of Biterminals in the Repeat
Fig. 1S is the Quadrilateral Foundation Mesh B=2
Fig. 2F is the Hexagonal Foundation Mesh, B=3, & Fig. 2G is the Regular Triangular Mesh, its dual.

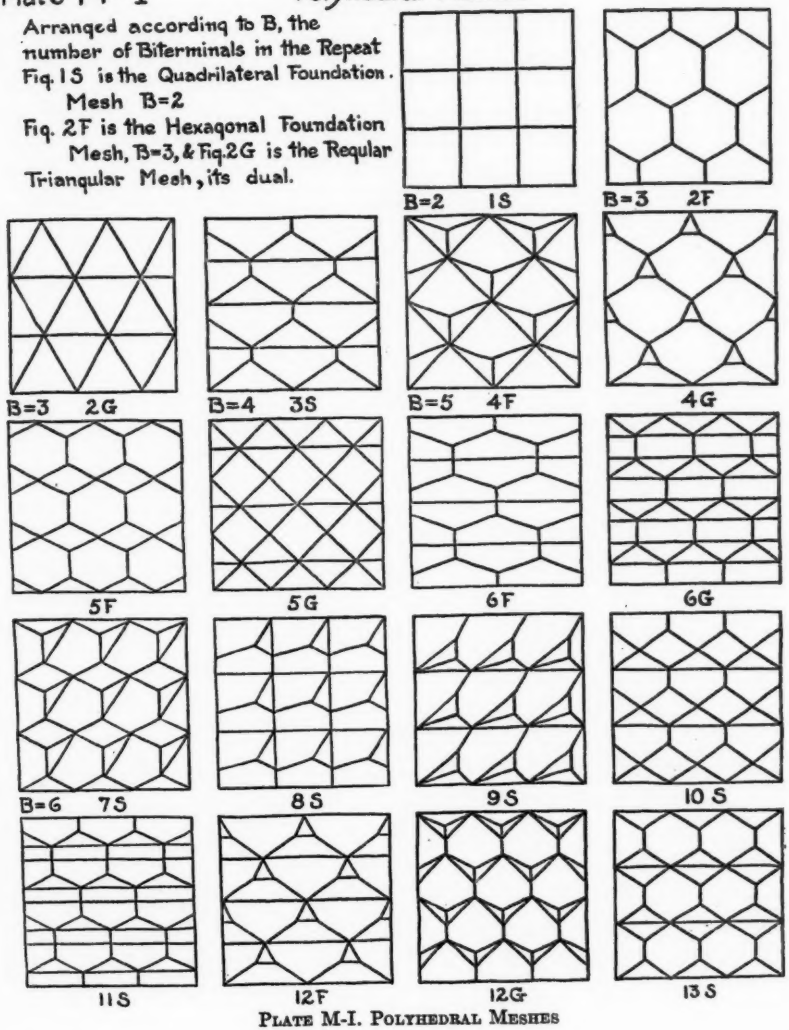

PLATE M-I. POLYHEDRAL MESHES

SIMILARITIES OF MUSICAL CONCEPTS IN ANCIENT AND MEDIEVAL PHILOSOPHY

JULIUS PORTNOY

Plato (427–347 BC) is the most notable of the Western philosophers to maintain that music, in both the classic and modern sense, should be used for the attainment of a sound morality. Views similar to his were commonplace in both the Near and Far East. In the Near East, the Hebrews furnish the best known example of a people who held such ethical attitudes towards art. In the Far East, they were stated clearly and forcefully by Confucius (551–478 BC). The aesthetic concepts of this Oriental sage had a strong though intermittent effect on Chinese music, while the Platonic and Hebraic philosophies of music which were fused in the zealous writings of St. Augustine (354–430 AD) were retained by the Church during the Middle Ages, the Renaissance and the Reformation.

What appeared as mere aesthetic theory in the Platonic dialogues became an artistic actuality in the Middle Ages. This transition from Greek aesthetic theory to medieval musical practice was made when some of the Patristic Fathers introduced Plato to early Christianity as an infallible authority whose views on music should be used as a criterion of judgment in the realm of the sacred as well as the secular. The Church Fathers stressed certain of the characteristic Platonic views: (1) that music has strong ethical implications; (2) that music is a highly effective means to attain a desired emotional state; (3) the traditional relationship of text to tune; (4) distrust towards musical innovation. These four aesthetic theories of music did not remain exclusively Catholic. The aesthetic influence which Plato exerted on Plotinus (204–269 AD) in the Greco-Roman period and later on St. Augustine, also had its overtones in the musical aesthetics of Luther (1483–1546 AD) and Calvin (1509–1564 AD).

Plato was not altogether original in his views on the place of music in a well ordered society. Nor was he the first to consider the ethical implications that music presumably has upon character and human behavior. Yet, Plato remains an invaluable historical figure to whom we must turn for a starting point if we would develop an aesthetic of music in Western Civilization. Not only do his writings contain a synthesis of the musical theories of his own day, but they gather up the musical practices of the Athenian generation which preceded his own.[1]

The Platonic writings unfold a number of Egyptian and Oriental musical concepts. Pythagoras (6th cent. BC) and Herodotus (5th cent. BC) both travelled in Egypt studying the music of the Pharaohs. Plato profited from their journeys, but in return ridiculed the followers of Pythagoras for their harmonic experimentation, as though he were seeking to cancel his debt to the mathematician with scorn.[2] Pythagoras probably came back to Greece with some elementary acoustical theories along with his other observations of Egyptian music. But Plato became disdainful of this facet of Pythagorean theory which dealt with

[1] *Protagoras.*
[2] *Republic*, Bk. VII, 531.

tonal development. His own interest in music was primarily moralistic. The impress which his philosophy of music left upon generations that came after him was indeed great. There is no evidence whether Hebraic music was affected by him directly, but Catholic and Protestant liturgical music still bear the Platonic stamp on their pages. This sustaining Platonic influence can be traced to those four musical concepts already mentioned that the founder of the Academy espoused in his writings. While evaluating their effect upon Western religion and culture it would be well to point out conceptual similarities in the theories of music which preceded Plato as well as those that followed him.

We do not know whether Plato had any actual knowledge of the philosophy which Confucius had taught in the East. The similarity of their philosophies of music may be mere coincidence, but numerous passages which originally appeared in Confucius are all but restated in Plato. In a passage which has reference to ethics and religion Confucius writes: "The music of Cheng is lewd and corrupting, the music of Sung is soft and makes one effeminate, the music of Wei is repetitious and annoying, and the music of Ch'i is harsh and makes one haughty. These four kinds of music are all sensual music and undermine people's character, and that is why they cannot be used at the sacrifices."[3] In the third book of the *Republic*, Plato stressed the ethical implications of music in a strikingly similar way.[4] He advocated that the Ionian and Lydian modes should be banished from the State since they were of an effeminate, soft, and relaxing character. The Dorian and Phrygian modes that were military in tone should be retained. Plato thereby begins to construct his system of a musical aesthetics by attributing morality to the Greek modes. "Rhythms and music in general," he concludes in the *Laws*, in a manner similar to Confucius, "are imitations of good and evil characters in men."[5] His student Aristotle echoed the same thought in the second chapter of the *Poetics*.

Plato's vitriolic denunciations of the new musical tendencies in his day were not taken seriously either in Greece or neighboring countries. These innovations were not only popularly accepted by the Athenians themselves, but Greek music penetrated into Palestine and became the fashion among the intellectuals there, much to the dismay of the spiritual leaders. Greek music must have affected the cultural life of the Jews in Palestine severely, for, prior to the destruction of the Temple, the religious guardians of Judea took up the cry that the secular strains of the Greek pagan were having a bad moral effect upon the Jewish populace. The spiritual leaders of Judea admonished their people, even under threat of divine punishment, to give up "immoral" Greek songs of lustful implications and return to their own sacred tunes even on festive occasions.[6]

The Patristic Fathers who nurtured Christianity through her unstable infancy were as seriously concerned with the moral aspects of music as the Hebrews.

[3] *The Wisdom of Confucius*, p. 264; Translation by Lin Yutang; Modern Library: 1938.
[4] 399.
[5] Bk. VII, 798.
[6] Idelsohn, A. Z., *Jewish Music, In Its Historical Development*. Holt, N. Y., 1929, pp. 22, 92.

St. Augustine was particularly Platonic in warning the early Christians to guard against the licentious tunes emanating from the Roman theatre that might draw them from a righteous or moral life. This zealous convert came to believe that the infectious melodies of the street and the theatre were promptings of the evil spirit and were therefore sinful. The only good music, for him, was the religious music which brought men closer to God in a communion of song and worship.

The spirit of St. Augustine manifests itself more than a thousand years later in the philosophy of music which John Calvin laid down for the Huguenots. Like the Church Fathers, Calvin wrote of music that "properly practiced it affords a recreation but it also leads to voluptuousness . . . and we should take good care that it does not furnish the occasion for dropping the reins to dissoluteness or for causing us to become effeminate in disorderly delight."

The second point that we shall consider is the role music has played as a psychological means for the attainment of a desired emotional, religious and social end in ancient and medieval philosophy. Plato held to the view that music should be one more instrumental force in the establishment of virtue and morality. He regarded music as being superior to the other arts on the premise that rhythm and harmony more strongly affected the inner soul and emotional life of man than architecture, painting, or sculpture, the spoken dialogue in tragedy or the witticisms of comedy. A child thus exposed to the proper musical modes would unconsciously develop discriminating habits and abilities which would allow him to distinguish good from evil. After music had moulded the character of the child and made him emotionally stable, the study of philosophy would reveal to him in full consciousness the highest knowledge. Music is here utilized in the building of the *Republic* as an indispensable preparation for philosophic knowledge.

Confucius also strove to create a political order based on a moral code. But man must first achieve a moral harmony within his own being. This inner harmony, Confucius rationalized, can only come from being subjected to the proper kind of music for "Music and the government are directly connected with one another." "Music harmonizes the community." Music is a powerful force which is to help "bring about unity in the people's hearts and carry out the principles of political order." Music also develops discriminating habits: "Therefore the ancient kings did not institute rituals and music for the mere purpose of satisfying the desires of our senses, but rather for teaching the people the right taste."[7]

The Hebrew Prophets also looked upon music as a tool for the conveyance of ideas. They told their people "that profane songs of love and lust are sufficient cause to destroy the world, and that Israel's religious songs can save it." Therefore, "if you have a sweet voice, glorify God with the gift He bestowed upon you, chant the *Shema*, and lead the people in prayer."[8] Religious music alone could bridge the ephemeral gap between God and man. Numerous references in the Old Testament touch upon the secular nature of music, but it is usually dis-

[7] *Op. cit.*, pp. 16, 252–255.
[8] Quoted in Idelsohn, p. 92.

tinguished from the sacred. When Judea was taken into captivity in later years the religious and secular music of the Israelite became inseparable. Music offered the Hebrew a means of emotional relief through which he could express his longing and grief. It was not an expression of a freely creative people but a means of imploring Jehovah for deliverance from bondage.

Augustine's prime interest in music lies in its effectiveness in bringing the pagan into the fold and in how music as a psychological device could be instrumental in heightening the religious enthusiasm of the average churchgoer. If music to which the *Psalms of David* were sung attracted the populace and brought them to church, then according to Augustine, music served a useful purpose. He candidly states this much in his *Confessions:*

> Sometimes, in the desire of having the melody of all pleasant music, to which David's Psalter is so often sung, banished from both mine own ears, and out of the whole church too: . . . I call to mind the tears I shed at the hearing of thy church songs, in the beginning of my recovered faith, yea, and at this very time, when as I am moved not with the singing, but with the thing sung (when namely they are set off with a clear voice and suitable in modulation), I then acknowledge the great good use of this institution. Thus float I between peril of pleasure, and an approved profitable custom: Inclined the more (though herein I pronounce no irrevocable opinion) to allow the old usage of singing in the Church; that so by the delight taken it at the ears, the weaker minds be roused up into some feeling of devotion. And yet again, so oft as it befalls me to be more moved with the voice than with the ditty, I confess myself to have grievously offended: at which time I wish rather not to have heard the music.[9]

Luther regarded music as a rhythmic language which could more effectively than mere prose educate men and bring them closer to an understanding of God. However creative a musician Luther may have been, his aesthetic theories are saturated with a theology that is altogether reminiscent of Augustine. Early Protestant musical thought had an artistic creed, to be sure, but it was based on religious and organizational needs closely patterned on the methods of the Mother Church. The leaders of the Reform, like their Catholic predecessors, had to make use of every means possible to win over the emotional and psychological forces in man, and the intrinsic qualities of music suggested themselves to Luther as one important means of helping the Protestant movement in Germany succeed.

Our third point to consider is the relationship of the melody to the text in the music of antiquity and the middle ages. Plato retained the traditional Greek attitude that lyric and tune should not be separated from one another. To the Greek bard any such distinction would have been purely academic, since poet and musician were one and the same person, who composed his ode as a musically rhythmic poetic legend or deed, thus releasing his story in song. Plato emphasized the moral value of the text by subordinating the musical form to poetry. He was particularly displeased with the tendency in his day of revolutionary musicians who were actually creating music without words for the sheer sake of hearing pleasant sounds, thus evoking moods conducive to a social life unbecoming a Greek citizen. "When there are no words," he writes, "it is very diffi-

[9] Bk. X, Chapt. xxxiii, p. 167 f., Vol. II, Translation by William Watts, Loeb ed.

cult to recognize the meaning of the harmony and rhythm, or to see that any worthy object is imitated by them."[10] Aristlotle took the view that, "Melody even apart from words has an ethical quality."[11]

The Oriental and Jewish philosophers generally considered melody to be subordinate to textual needs. In Jewish music the text was primary. Instrumental music was used mainly to accompany and embellish. The Rabbis even regarded instruments with misgiving since they enabled Jewish singers and dancers to emulate pagan forms of worship within the Temple. The Rabbis further maintained that the Holy Scriptures were more important in worship than vain melodic invention and tuneful accompaniment.

St. Augustine stressed the desirability of using only biblical texts for religious music. Although he did not formally sanction the use of biblical texts adapted to the popular folk-tunes used in his day, he was well aware of the infectious character that a catchy tune could have on the masses. The saving grace for a street song or folk-tune lay in its aesthetic marriage with a scriptural passage that would allow the ordinary Christian to become more familiar with the sacred text. The Patristic Fathers considered the text superior to the melody and the Scholastics in later centuries retained this view even after the hymn slowly but surely became established in the Service as a musical form with a secular text.

The musical precepts which Calvin taught to a puritanic and self-denying French Protestantism stand out as a glaring travesty on the cultural history of France. It was in France that the earliest forms of organum were developed into independent polyphonic writing. The secular motet was perhaps the outstanding contrapuntal development of the Notre Dame School in the late 12th and 13th centuries. Yet, some three hundred years after France reigned musically supreme in Europe, Huguenot music was relegated to a missionary function for the propagation of the new faith. Calvin demanded that the Protestant composers confine their creative activity to simple harmonization of the Psalms. He allowed only the simplest forms of congregational singing for devotional services. Rather begrudgingly, he permitted some polyphonic settings of the Scriptures, but this more complex type of music was to be sung in the home and among friends. Even in the home or among friends, cautioned Calvin, the performers were to remember that they were singing Holy Writ.

The last of the four concepts which we shall consider deals with the element of change in ancient and medieval music. Thales' classic rebuke of Homeric legend as a distortion of reality is the earliest instance of philosophic censure of artistic license and innovation in pre-Socratic philosophy. The father of ancient philosophy was not the first to pass judgment on the creative artist, but Thales did presume that the philosopher could distinguish reality from illusion. The philosopher and the priest have, on the contrary, hampered artistic trends more often than not through the centuries. Time has proven them to be the false prophets while the artist they so "judiciously" censured not only intuited the reality of his own era but anticipated the needs of the future.

[10] *Laws*, Bk. II, 669–670.
[11] *Problems*, XIX, 27, 919 b 26.

Philosophic and religious censure of change was as much in evidence in the East as in the West. Pythagoras, who probably was in Egypt in the sixth century, relates that the High Priests of Pharaoh vehemently protested against the innovations of musical virtuosi. The Priests argued that the artistic change was artificial and therefore dangerous to the spiritual and physical life of the nation.

Confucius, a talented musician, who sang, played several instruments and edited a book of songs with accompanying music, also lamented over the changes that had infiltrated Chinese music. It was his firm belief that the music of the past was the true prototype of "heavenly music" and the new music was rhythmically incongruous with nature. Man had thus debased this "heavenly music" and so himself by falling out of rhythmic grace with nature.

Plato was most vitriolic in denouncing musical innovation. Although he was a creative artist in his own right, he yet retained a fanatical mistrust of the erratic artist whose restless cravings were constantly manifesting themselves in artistic change of newly created art forms. Plato feared that artistic license could only lead to anarchy in the state. It was on the basis of this conviction that he writes in the fourth book of the *Republic:*

> The attention of our rulers should be directed,—that music and gymnastic be preserved in their original form, and no innovation made. They must do their utmost to maintain them intact. And when anyone says that mankind must regard 'The newest song which the singers have,' they will be afraid that he may be praising, not new songs, but a new kind of song; and this ought not to be praised, or conceived to be the meaning of the poet; for any musical innovation is full of danger to the whole state, and ought to be prohibited. So Damon tells me, and I can quite believe him;—he says that when modes of music change, the fundamental laws of the State always change with them.[12]

The Judaic hierarchy were equally suspicious of heretical influences that might affect Jewish law and ritual. New ideas, artistic, philosophic or theologic, were immediately brought under surveillance. But the spiritual leaders of Jerusalem were not altogether successful in mitigating new trends either in the era prior to Christianity or after the Jews were compelled to wander through foreign lands. Alien cultures always had a strong effect upon these Jewish wanderers, and the Jews, in turn, influenced the countries which befriended them. The Rabbis nevertheless kept exhorting their people not to ape the ways of the respective countries in which they found themselves. Alien Western music is as foreign to Jewish life, warned the Rabbis, as Christian theology is to the *Old Testament.* What displeased the Rabbis all the more during these years of endless wandering were unorthodox secular strains that would on occasion make their way into the Jewish Service. The introduction of new songs into the Synagogue invariably aroused protest against innovation and disregard of tradition. As late as the 16th century in Germany, the Rabbis complained bitterly against those cantors who were abandoning the old sanctified tunes inherited from their fathers.

Augustine expressed grave concern that popular changes in liturgical music

[12] 424.

would eventually alter the sanctity of the liturgy itself. He believed that since popular strains, folk-tunes and innovating musical tendencies stemmed from pagan sources and the illiterate populace, the introduction of such worldly tunes into the religious ritual would only enhance pagan art rather than Christian virtue. Therefore, concluded Augustine, liturgical composers must confine their creative talents to pure ecclesiastical forms if they would foster Christian needs. Pope Gregory I (d. 604) thought so well of this Augustinian bit of logic that he initiated a campaign to preserve the traditional Church music by shielding it against all outside influences that might be of an unreligious or carnal tone.

Martin Luther had a clear conception of the kind of music the Protestant Church would need to fully emancipate itself from papal influence. If he was to appeal directly to the German people then neither the Latin language nor the Gregorian chants were the best means of reaching the common man. To achieve his end Luther introduced German to replace the Latin of the Catholic service; and as a substitute for the complex Gregorian chant he chose music that was simpler and less pretentious, more akin to German folk song.[13]

In summary, it would be well to reflect briefly on the attitudes with which music was regarded in ancient and medieval philosophy. Herodotus relates that the Egyptians considered their religious melodies as being sacred in origin and for that reason would not allow any innovations or admit foreign tunes in their devotional services. Plato elaborated on this theme in the *Laws* [14] by adding that the Egyptians accredited their sacred melodies to the goddess Isis. He then goes on to praise the Egyptians for their ability to create melodies which had the power to subdue primitive passions in man and purify the spirit. The implication is that only strictly tempered musical modes and tunes that were emotionally effective because of their direct simplicity were worth while.

Musical simplicity was not incongruous with natural law, argued Plato in the same manner as Confucius had before him. Like Confucius, his numerous comments on music imply that music could help man to rhythmically attune his finite soul with the infinite, through gracefully blending his thoughts and actions with the celestial bodies comprising the harmony of the spheres. Raucous cacophony was not only foreign to Greek culture, concluded Plato,[15] but caused the human soul to clash with the ideal order of things.

The leaders of Israel were in common accord with the Egyptians in opposing foreign influences. State and religion were one to the Egyptians, Greeks and Jews. A religious innovation could endanger the state. No wonder they guarded the music in their respective temples as diligently as their sentries queried each stranger who would enter their midst.

The Patristic Fathers kept admonishing their flock to turn a deaf ear to Roman tunes which vilified true Christianity. Each move that the masses made to inject secular strains into the Service was fought by the Church from its very inception into the ensuing centuries. But the people were adamant in bring-

[13] Leichtentritt, Hugo, *Music, History and Ideas*, p. 105; Harvard Univ. Press, 1938.
[14] 657.
[15] *Laws*, 812.

ing folk-tunes into their house of worship, and the Catholic hierarchy learned to become conciliatory in accepting inevitable musical trends. The Church insisted on tradition and simplicity but even her liturgical composers could not help vent some of their creative energy in creating new forms.

The Platonic strain which permeated early Church music was more ably championed by St. Augustine than any of the other Fathers. We noted that Confucius and Plato were creative artists whose judgments of music were often harsh and puritanic. This paradoxical trait of the philosopher with a bent towards the arts comes out just as severely but more realistically in Augustine. The philosophic theories of music which Plato expressed in the *Republic*, *Laws* and other dialogues were not put into practice in his own times. When we come to the early centuries of Christianity, these exacting Platonic admonitions were so effectively championed by Augustine that they became a pattern of ethical principles which characterized medieval music until the rise of humanism in western civilization some eight hundred years later.

Augustine was a teacher of rhetoric as a young man and later became a well known interpreter of poetry. Sometime before his baptism he started the treatise *De Musica*, which is highly mystical and is devoted mainly to metre, verse and theories pertaining to numbers. Toward the end of this work, which consists of six books, Augustine attempted to analyze music in a manner that we in our own day would call psychological. The tenor of the treatise is both Pythagorean in its treatment of number relationships and Platonic in its ethical platitudes. This treatise, together with his moralistic remarks pertaining to music in the *Confessions*, crystalized official Catholic thought on the function of music in the church and state.

The humanistic spirit that was brought to the western world with the re-birth of Aristotle came to a sorrowful end musically at the Council of Trent (1543–1563). Presumably, the Catholic dignitaries sought to clean house artistically and theologically, which meant a return to the simpler ways of the past. Aristotle would serve the Church well in matters of theology, reasoned the Council, and music must follow the voice of Plato as echoed in St. Augustine. Palestrina came to the aid of polyphonic music, but its liturgical survival depended on conceptual reservations. The Church had once more compromised with what it could not help but accept artistically. Protestantism lived through the same pattern of musical blunders, reiterating rather than foregoing these Scholastic aesthetic fallacies.

Luther was not adverse to musical change, but the change had to be in keeping with Protestant needs. The task of compiling a Protestant repertoire of liturgical music found Luther confronted with a dilemma. Although he was an undeniable revolutionary religious zealot, he never ceased admiring the rich polyphonic music of Catholicism. He appropriated melodies from the Ambrosian hymns, medieval sequences and Gregorian Chants of the Mother Church. These tunes were revamped, simplified and fitted to his majestic chorales. He took the folk-tunes of the German people and wove them into the spiritual music of the Protestant faith. Whether Luther personally composed or guided these musical activities is not known for certain, but he must have manifested a profound understanding and love of music, from what can be gleaned of his writings.

Calvin was distrustful of Luther's liberal musical concepts. Just as the Church Fathers warned the early Christians against pagan tunes, so Calvin fanatically set out to obliterate whatever vestige of Catholic music remained in Protestantism. He unforgivably stifled creative initiative and reduced Huguenot music to the most elemental forms. In his efforts to re-capture the original Christian spirit of simplicity and rid Protestantism of ritual and ceremony, his philosophy of music became as puritanic as those fostered in Plato and St. Augustine.

The apparent suspicion of foreign influences and innovations which the philosophers and religious leaders have harbored toward music appears to have been similar in the East and West. The four musical concepts which were considered in this paper as a phase of Chinese, Greek, Hebraic and medieval philosophy, are focal points of the aesthetic similarity of these cultures. We need only glance at our modern aesthetic theories to become aware that we have not yet fully discarded these outmoded patterns of musical thought either for the church or state.

CUBISM AND SCIENCE

PAUL M. LAPORTE

Foreword. In their important book on cubism[1] which appeared in 1912, Gleizes and Metzinger wrote as follows: "It therefore amazes us when well-meaning critics explain the remarkable difference between the forms attributed to nature and those of modern painting, by a desire to represent things not as they appear, but as they are. As they are! How are they, what are they? According to them the object possesses an absolute form, an essential form, and we should suppress chiaroscuro and the traditional perspective in order to present it. What simplicity! An object has not one absolute form: it has many: it has as many as there are planes in the region of perception. That which these writers describe is marvellously applicable to geometrical form. Geometry is a science; painting is an art. The geometer measures; the painter tastes. The absolute of the one is necessarily the relative of the other; if logic is alarmed at this, so much the worse!" The particular meaning of this passage is elucidated by the following lines: "We seek the essential, but we seek it in our personality and not in a sort of eternity laboriously divided by mathematicians and philosophers." The idea that the "essential" is to be found in the personality and not in the object is obviously influenced by the subjectivism of the fauves. Nevertheless, the authors have understood the need for an objective standard or "convention," when they continue: "We cannot enjoy in isolation. . . . From a reciprocity of concessions arise those mixed images, which we hasten to confront with artistic creations in order to compute what they contain

[1] Albert Gleizes and Jean Metzinger, *Cubism*, Eng. trans. London and Leipsic, 1913, pp. 46 ff.

of the objective; that is, of the purely conventional. . . . If the artist has conceded nothing to common standards, his work will inevitably be unintelligible."

It is the thesis of this paper that cubism has created such a common standard or convention. If cubism still remains unintelligible to a great many people, it is because its very conventions (or concepts) are still not understood. These concepts, it is assumed, are not of a kind particular to painting but are, on the contrary, underlying all realms of advanced contemporary thinking. They even are, if only to a very small degree and haphazardly, becoming operative in the realm of social and economic organization; yet the immenseness of our present crisis is a measure of the degree to which they are still kept from operating universally. The answers to the crisis are already found in the ideal realm of the sciences, humanities, and the arts. But they cannot be implemented by practical action for the very reason that these ideas, as ideas, are not yet accepted universally.

The best manner to explain the new concepts in painting is by correlating them to the theories of contemporary physics. Such a method of explanation is not quite as surprising as it may seem, if one considers that both physics and painting are concerned with the same problem, namely the nature of space. The profound change in modern physics, and with it of philosophy, came when it was recognized that space and time could no longer be conceived as absolutes, but must be considered as being in an integral and functional relationship with one another. The equally profound change in painting, which occurred at exactly the same time, can best be explained in terms of the very same functional relationship of space and time. A premonition of this can be found in Apollinaire,[2] who wrote in 1911 that ". . . the fourth dimension—this utopian expression should be analyzed and explained, so that nothing more than historical interest may be attached to it. . . ."

This paper is not concerned with the aesthetic quality of painting as such, nor with any aesthetic questions in the strict sense of the word. It tries to explain and to analyze the potentially intelligible vocabulary and syntax of cubism. By doing so it should free, rather than restrict, aesthetic appreciation. It must be clear, however, that the division between the intelligible and both the sensual and emotional in art exists in analysis only. In the creation as well as in the appreciation of a work of art, meaning and sense-appeal, convention and feeling, are interchangeable and indivisible.

Therefore, the creation of a new idiom in art is, after all, an aesthetic achievement, and not merely an intellectual tour-de-force. Many were the attempts of painters in the first decades of this century to direct themselves toward the development of this new idiom. But not one of those who contributed to the beginnings of cubism advanced so far as did Picasso. This is a sign not only of an exceptionally keen intellect but also of a superior creativity.

The theory of cubism. It is noteworthy that cubism, in spite of its obviously intellectual bent, was little interested in articulating a theory or program of its own. Even its earliest apologists were more descriptive or poetic than programmatic or analytical. And when, thirty years later, Barr[3] used the analytical

[2] Guillaume Apollinaire, *The Cubist Painters*, 1913; Eng. trans. New York 1944, p. 12.
[3] Alfred H. Barr, Jr., *Picasso, Forty Years of his Art*, New York, 1939, p. 59.

method to lay open the genetics of the movement, he was still very cautious in his generalizations. Ozenfant's[4] pronouncement that "cubism had (and has) no well-defined theory" is still valid today.

It is in the light of Barr's genetic analysis that the lack of theory in the cubist movement must be understood. The cubists wanted to continue Cézanne. For them both the decreasing importance of subject-matter and the corresponding increase of subjectivity as proclaimed by the fauves[5] was only an expedient means to their own ends. "The point of departure must be Cézanne: without him there would be no meaning in cubism."[6]

No artist was more disinclined to theorize than was Cézanne. Yet it was from his famous remark about the "spheres, cylinders, and cones" as principles of form in painting, that cubism drew its initial inspiration.[7] Cézanne's observation marks the final point of departure from occidental perspective as first developed in the fifteenth century by Masaccio, van Eyck, and Witz. Cézanne was the first to realize that the unifying factor in the painting is not one point of view to which all shapes, sizes, and proportions of the objects represented are to be referred. Apparently, the unifying factor in painting was, to him, the universal geometry of the objects. Each side of an object or of a plane, he says, "directs itself toward a central point." Did he mean to say that all the geometric forms direct themselves toward one central point in the picture, or that each geometric form, or at least each area has its own central point? His painting seems to favour the latter interpretation.[8]

In acknowledging and emphasizing the geometric quality of space, Cézanne re-introduced those tactile and hence kinesthetic qualities in nature which were all but lost in impressionism. This is a point of the utmost importance in the understanding not only of Cézanne's work but even more so of the conclusion drawn from it by the cubists. The interpretation of perceived light-rays as representing three-dimensional bodies in space is possible only on the assumption that the observer is moving during the process of perception. By exclusion of the actual movement in this process, and by implying it in the process of perception, Cézanne's geometric interpretation becomes a concept.

Two recurrent observations in the early writings on cubism assume new significance in the light of these remarks. One of these observations is expressed by Gleizes and Metzinger: "From now on," they say, "we stipulate that the only difference between the latter school (cubism) and the art manifestations preceding it, is one of *intensity*."[9] The other observation is formulated by Apollinaire. "Representing planes to denote volumes," he says, "Picasso gives

[4] Amedée Ozenfant, *Foundations of Modern Art*, Eng. trans. New York, 1931, p. 79.

[5] Arthur Jerome Eddy, *Cubists and Post-Impressionism*, Chicago, 1914, pp. 45 f. Matisse about himself: "A picture should, for me, always be decorative. While working I never try to think, only to feel. . . . It makes no difference what are the proportions, if there is feeling."

[6] Ozenfant, op. cit. p. 50.

[7] R. H. Wilenski, *Modern French Painters*, New York, 1939, p. 202.

[8] Cf. Erle Loran, *Cézanne's Composition*, Los Angeles, 1946, p. 8. In the very vagueness of Cézanne's expression one may find an indication that he was not particularly aware of *one* central point.

[9] Gleizes, etc. op. cit. pp. 16–17; quoted by Ozenfant, op. cit. p. 51.

an enumeration so complete and so decisive of the various elements which make up the object, that these do not take the shape of the object, thanks to the effort of the spectator, who is forced to see all elements *simultaneously* just because of the way they have been arranged."[10]

Intensity and simultaneity are, in this case at least, correlative terms. What is intense displays a great amount of energy. The opposite of the energetic is the inert. The inert is also static, the energetic dynamic. If cubist "intensity" refers to a dynamic quality, then it actually refers to movement. The term "simultaneity" on the other hand presupposes the existence of something that is not simultaneous. Now we know that visual perceptions—on account of the directionality of our visual apparatus—are never completely simultaneous. But the continuity of perception itself proceeds in and through movement. The term simultaneity thus refers to the attempt of the painter to express the movement of—or in—perception. The common denominator of intensity and simultaneity is movement.

Only a few years after the first cubist pictures had been painted a new movement was started that elaborated on the dynamic implications of cubism: futurism.[11] The futurists were very articulate as to their aims and aspirations. One quotation is sufficient to illustrate their preoccupation with movement and dynamism. "Action, in our works, will no longer be an arrested movement of universal dynamism. It will be, simply, dynamic sensation itself.—Everything moves, everything runs, everything turns swiftly. The figure in front of us never is still, but ceaselessly appears and disappears."[12] It is probably this very articulateness which became fatal to the futurists. They were too literal about the interpretation of their aims. "A galloping horse," says Boccioni,[13] "has not four legs: it has twenty, and their movements are triangular." At this time, moreover, the particular aims of futurism were taken over by the legitimate new medium of the motion pictures. Nevertheless, as an illustration of the spiritual mood of the period the enunciations of the futurists are unsurpassed. In this sense, and in this sense only, are they applicable to cubism. But the futurists tried to suggest movement by a compilation of a series of still figures. Picasso chose the harder task of arriving at a new dynamic interpretation of nature by the slow process of *transforming* the dynamisms of perception into the physically static medium of two-dimensional painting. "The pretense of representing the weight of bodies and the time spent in enumerating their various aspects is as legitimate as that of imitating daylight by the collision of an orange and a blue. Then the fact of moving around an object to seize several successive appearances, which, fused in a single image, reconstitute it in time, will no longer make thoughtful people indignant."[14]

The conceptual character of cubism. Already the dictum about the "spheres, cones, and cylinders" had made it clear that Cézanne's transcendence of impres-

[10] Apollinaire, op. cit. p. 19.
[11] Alfred H. Barr, *Cubism and Abstract Art*, New York, 1936, pp. 56 ff.
[12] Robert Goldwater and Marco Treve, ed., *Artists on Art*, New York, 1945, p. 435.
[13] Goldwater, op. cit. p. 435.
[14] Gleizes, op. cit. pp. 54 f.

sionism (which was obviously marking the climax of the purely perceptual operation of art) worked in direction of a new conceptual approach. This is one of the few points on which the cubists themselves as well as their literary apologists were very articulate. Picasso wrote in 1923: "Art does not evolve by itself, the *ideas* of people change and with them their mode of expression."[15] Braque said in 1917: "There is no certitude but in what the *mind* conceives."[16] Apollinaire wrote already in 1912: "Cubism differs from the old schools of painting in that it aims, not at an art of imitation, but at an art of *conception*."[17] Ozenfant wrote repeatedly about the new *conception* in art initiated by Cézanne and carried on by the cubists. He emphasizes the negative aspect of the cubist concept by his insistence on the freedom from exterior subject-matter, while Eddy[18] emphasizes its positive aspect in the use of the geometry of planes. All these pronouncements make it clear that cubism, at least in its beginnings, was predominantly a conceptual, that is, an intellectual art.

The shift from the perceptual approach of impressionism to the conceptual approach of cubism may be interpreted on more than one level of the general historical development. The perceptual approach in painting got under way with Cimabue and Giotto, in the thirteenth century. Byzantine art, which was basically conceptual, is being replaced by slowly increasing observations, and by a steadily accumulating knowledge about the visual appearance of nature. By the first half of the seventeenth century a consistent interpretation of nature is completed which is not any longer based upon the application of mathematical perspective but on the varying intensities of light. The perfection of this mode of interpretation is found in the work of Velasquez and Hals. The second wave of the perceptual art of the post-medieval period started with Delacroix and culminated in the impressionists of the eighteen-seventies. Color is now no longer taken as an incidental quality of light, but as an integral part of it.

This development of painting is paralleled by a similar development in science. It is said of Galileo that with him, after twenty centuries of mere description and consideration of form, there came into being a real analysis of nature.[19] His discovery of the law of falling bodies has become so important for the development of the scientific method because he limited himself to pure experience (perception). He did not try to find "why" the stone falls but he expressed "how" it falls. Similarly, Velasquez and Hals limited themselves to the perception of light. They were not concerned with the quality of bodies as such but with how they appear to the sense of vision.

The corpuscular theory of light was finally replaced by Fresnel's and Young's wave-theory in the early nineteenth century.[20] According to Einstein, the success of the wave-theory made the first breach in Newtonian physics. The famous Michelson-Morley experiment in 1887 showed that the problems that

[15] Goldwater, op. cit. p. 418.
[16] Goldwater, op. cit. p. 422.
[17] Apollinaire, op. cit. p. 14.
[18] Eddy, op. cit. p. 101.
[19] Heinrich Schmidt, *Philosophisches Woerterbuch*, Leipzig, 1934, p. 196.
[20] Sir William Cecil Dampier, *A History of Science*, Cambridge and New York, 1946, pp. 240 f.

had accumulated during the late eighteenth and during the course of the nineteenth century could no longer be solved on the basis of Newtonian physics. Again, this development of science is paralleled in the development of painting. Fresnel and Young were contemporaries of Delacroix. The division of light into color as started by Delacroix and carried to its conclusion by the impressionists is based on the assumption that color is not a surface-quality of a body (and therefore incidental), but a quality of light itself, and hence universal. The integral quality of color is *rationally explained* by the wave-theory, just as it is *expressed* by the color displacement and color-division of impressionism.[21] By the time of the Michelson-Morley experiment, impressionism had already transcended its climax. With Cézanne as the pioneer and Gauguin, van Gogh and Seurat as second generation, painting was searching for a new interior structure that would give new tectonic solidity to the perceptual refinement of impressionism. Impressionism posed the same problem as the Michelson-Morley experiment: a new theory (structure) was needed to explain the results of the Michelson-Morley experiment which was no longer explainable in terms of Newtonian physics; a new structure (theory) was also needed to reinforce the purely sensational character of impressionism. In both cases, only a complete reversal of basic concepts would remedy the situation. In science, this reversal is to be found in the fact that non-Euclidean geometry could no longer be taken as an empty mathematical exercise but assumed physical meaning through the theory of relativity.[22] In painting, the reversal is from a perceptual art (the implicit conceptual nature of which had become apparent)[23] to an ideal or imaginative art whose conceptual basis was clearly recognized. Already in 1902 Klee wrote: "I will no more project some plan of it (the object): I will proceed so that all its essentials, even those hidden by optical perspective, will appear upon the paper."[24]

Dewey expresses the situation very clearly. The change in science took place, he says, "when it was found that the process of conceptual abstraction could not be carried to the point of excluding the act of observation without the possibility of verification."[25] Reversing this statement, one could say of

[21] J. Carson Webster, "The Technique of Impressionism," *College Art Journal*, Vol. IV, No. 1, pp. 20 f. "Divided color," says Webster, "is a means of recording colors in intimate association, in interpenetration, as it were, within a given area, while allowing each to be seen for what it is." It is the great merit of Mr. Webster's article that, in it, he has exploded the myth of retinal color fusion in impressionism and neoimpressionism. The vibrating quality of impressionist color, which is the artistic equivalent to the wave theory in physics, would be lost if retinal fusion took place. As Mr. Webster shows, this is true in spite of the fact that some of the impressionists believed in the scientific validity of this theory. But the very color division of impressionism paved the way for the new decorative and expressive use of color *per se* as initiated by Van Gogh and continued by the fauves under the leadership of Matisse. Possibly it is just this genetic factor which made the development of fauvism tangential to that development of cubism.

[22] Dampier, op. cit. p. 315.

[23] Dampier, op. cit. p. 316. The same seems to have been true of science. "During the greater part of the nineteenth century, most men of science, especially biologists, thinking they were keeping clear of metaphysics, accepted uncritically the model of nature put together by science as ultimate reality."

[24] Goldwater, op. cit. p. 443.

[25] John Dewey, *Art as Experience*, New York, 1934, p. 183.

painting that this art shifted to a new conceptual abstraction when it was found that the exclusive emphasis of perception was in itself a concept.[26] A similar change took place in the realm of politics and economics. As soon as through the mechanics of economic liberalism, a point of relative balance was reached between the available quantity of both resources and production on the one hand, and the available markets on the other hand, a new emphasis had to be placed on governmental organization in order to avoid social anarchy. That is, the empirical, self-regulating balance of demand and supply had become so precarious that the abstract structure of governmental law was needed to maintain the proper functioning of the economic process.[27]

From all the preceding consideration it becomes clear that the concepts which were operative throughout the post-medieval world were found inadequate in the early twentieth century. Contemporary science and technology themselves had invalidated the very concepts from which they had grown. In science, particularly, the relationships which could organize the vast amount of empirical material at hand could no longer be those of absolute space and absolute time. A new concept of a functional time-space relationship had to be developed. In painting, through impressionism, design had lost the last vestiges of inner structure. Impressionism proved to be inadequate in the development of a new structural idiom.

The problem of kinesthetic experience. The emphasis on the dynamic quality of space is clearly pronounced in those quotations from early writers on cubism which have been cited previously: *intensity, simultaneity, and action.* In the realm of perception these are the equivalents of kinesthetic as distinct from purely visual experience. The most important contribution to the study of this problem has been made by Adolf Hildebrand.[28] Hildebrand, himself a rather mediocre sculptor, was a pupil of the eminent German painter Hans von Marées, and reflects a good deal of his master's ideas. His book is a penetrating analysis and summation of post-medieval aesthetics. It is significant that it was published at the very time when Cézanne started on the last and most significant phase of his work. The very exhaustiveness of analysis in Hildebrand's book points the way to the basic weaknesses of its aesthetic theory. "Our perception," says Hildebrand,[29] "consists of visual impressions and eye movements which follow each other in more or less rapid succession. Taking this mode of perception as a whole we must look upon it as a combination of two different elements. . . . For the percipient, the process of seeing, in the sense of reading-off spatially the appearance before him, goes on quite unconsciously, interpreting the visual appearance into a spatial idea. But in the process of representation he has to piece the spatial object together partly out of visual and partly out of kinesthetic elements: i.e. he places before himself some general visual picture and fills it out according to what may happen to be its plastic requirements."

[26] Paul Laporte, "The Space-Time Concept in the Work of Picasso," *Magazine of Art*, Vol. 41, No. 1, pp. 26 ff.

[27] Russell A. Dixon and E. Kingman Eberhart, *Economics and Cultural Change*, 1938, pp. 516 ff.

[28] Adolf Hildebrand, *The Problem of Form*, Eng. trans. New York, 1945.

[29] Hildebrand, op. cit. pp. 31 f.

While the two basic elements of perception, visual and kinesthetic, are clearly recognized here, there is not even the slightest hint at a principle that would be able to integrate them with one another. Rather, kinesthetic experience is conceived as a disturbing correlative of visual perception which should either be eliminated completely, or must be taken care of in a piece-meal fashion. The artist, says Hildebrand,[30] "divides and groups his . . . kinesthetic ideas, until there results a simple visual impression . . . which the resting eye is able to take in without kinesthetic sensations. . . ."

Hildebrand was reared in the Greek and Renaissance tradition; he takes it for granted that, ideally speaking, the work of art should be experienced "at a glance," i.e. without involving the biologically necessary time element. Yet it is obviously a sign of lacking freedom if an actual condition is recognized without its being made an integral part of action. As a matter of fact, some forms of integration of the kinesthetic experience into the two-dimensional picture plane were in existence all through the history of art. Outstanding examples are the ornamentation of vase surfaces in the Neolithic, the row composition initiated in Egypt, and the Celto-Germanic ornament of the early middle ages as it extended into the Gothic period. It was only Renaissance aesthetics, based on its late Greek predecessor, which made the—one might almost say futile—attempt to eliminate the kinesthetic experience from perception.

Hildebrand[31] writes:

> . . . the artist is compelled to separate clearly the two-dimensional appearance of the object from the general subjective idea of depth. . . . The figure lives, we may say, in one layer of uniform depth. Each form tends to make of itself a flat picture within the visible two dimensions of this layer, and to be understood as such a flat picture. . . . By this sort of arrangement the object resolves itself into a layer of certain uniform thickness. The total volume of a picture will then consist . . . of a greater or lesser number of such imaginary layers arranged one behind the other, yet altogether uniting into one appearance, having one uniform depth measurement.

A more exhaustive comprehension of the theory of early cubism, a more accurate description of Picasso's and Braque's early paintings can hardly be found. At the same time, this description shows how and where cubism was still dependent on the space concept of the Renaissance, or at least on the last interpretation it had found in Cézanne. The illusionistic presentation of depth remained an important factor during the beginnings of the cubist movement. Significantly, the evolution of illusionistic depth as initiated by Cimabue and Giotto, reversed itself in the course of post-medieval history; it ended with a conception of depth very close to its beginnings. Giotto, at the end of the thirteenth century, had worked with a very shallow relief space akin to that of the early cubist period, while Masaccio, in the early fifteenth century, had considerably increased the depth of space which brings Cézanne close to his conception.

It is the recognition of the illusionistic character of the third dimension in

[30] Hildebrand, op. cit. p. 82.
[31] Hildebrand, op. cit. pp. 80–82.

painting which makes understandable the return to "honest" two-dimensionality in the early twentieth century. "A line foreshortened in perspective," says Hildebrand,[32] "would express no depth; a combination of lines would never indicate objects as lying one behind the other, if we did not think them as outlines of certain objects." As soon, therefore, as the single object as object becomes a negligible factor for the artist, as was increasingly the case in painting since Cézanne, the picture is stripped of a whole set of depth suggestions, and perspective itself reveals its non-artistic character.

Though wrong in his emphasis on the object, Hildebrand draws the correct conclusions from his previous statement. "We can never see the precise distance," he says,[33] "We only infer it from our experience of viewing things from various points. A clear and definite idea of an object rests on its two-dimensional arrangement." With perfect logic, Hildebrand's reasoning leads toward a new two-dimensionality. Picasso and others arrived at it not many years after the first cubist experiments had gotten under way. But one inference in Hildebrand's conclusion had found expression already in Picasso's early cubism. The *Woman in a Landscape* of 1909[34] shows a combination of at least two points of view. Similar tendencies can be found also in some of the so-called "classic" pictures.[35] The overlapping layers of space of the early cubist period are often transparent, and it is obvious that different views of the same object have been combined here, as in *L'Arlésienne* of 1912[36] and other paintings.

The renunciation of three-dimensionality and the resulting return to the two-dimensionality of the picture plane had its basic reason in the recognition that painting should be satisfied with the utilization of its immediate physical resources. But the fauves made a short-cut to two-dimensionality by becoming completely subjective, and by intentionally disregarding the phenomena of three-dimensional space. The cubists, though apparently concurring with the fauves in the dissolution of subject-matter for the sake of the reinforcement of the picture plane, chose the harder way. They arrived at flatness not by revolt but by a thorough analytical process. Slowly they were retreating from illusionistic three-dimensionality, not without taking along with them those conceptual aspects of three-dimensionality which could be incorporated even in a two-dimensional design. Through this process they preserved the objective reality of space which, to the fauves, was but an occasion to follow their subjective bent.

Apollinaire says:[37] "Representing planes to denote volumes, Picasso gives an enumeration so complete and so decisive of the various elements which make up the object, that these do not take the shape of the object, thanks to the effort of the spectator, who is forced to see all the elements simultaneously just because of the way they have been arranged." This is a clear demonstration of the fact

[32] Hildebrand, op. cit. p. 62.
[33] Hildebrand, op. cit. p. 66.
[34] Barr, *Picasso, Forty Years*, p. 70.
[35] Barr, loc. cit. p. 104.
[36] Barr, loc. cit. pp. 77, 114.
[37] Apollinaire, loc. cit. p. 19.

that Picasso's "distortion" is not, like the fauves', serving merely subjective and "expressive" ends. Rather, it is the product of a new vision of "objective reality." In its intended completeness, this new vision is obviously made up of kinesthetic experiences whose integral and functional relationship with the visual perceptions is clearly recognized. Geometry, to Picasso, is not an end in itself, but a means to develop a new pictorial idiom capable of expressing kinesthetic experiences.

The transformation of the kinesthetic experience. The closer the observer approaches the object, says Hildebrand,[38] "the more eye movements will he have to make and the more will the original complete picture be split up into separate views. . . . To perceive in visual images the third dimension . . . we must imagine ourselves as changing our point of view, and as getting merely a succession of disconnected shifting views. . . ." Hildebrand has recognized the problem with unusual precision. The conclusion he draws, however, is completely in the sense of the Renaissance conception. "It is only in the visual projection that these demands (of shifting views) cease," he says, "and permit the unitary plane picture to produce its full effect unspoiled. This constitutes the great value of visual projection. It affords the only possible perception of form at a glance. For it is the only perception made up of homogeneous, i.e. purely visual elements." This homogeneity of elements is, of course, achieved by the purely arbitrary elimination of the time factor.

"Visual projection," i.e. "perspective," is that mode of space perception which has been valid in the painting of the past 600 years without being questioned. The problem of early twentieth century painting was to break up visual projection. But only Picasso shows a continuous development, not only in the gradual shedding of illusionistic depth, but also in the gradual incorporation of three-dimensional perceptions into a two-dimensional plane. He transforms the kinesthetic experience of three-dimensional space—which is dependent on the time factor—into purely visual elements.

This transformation was achieved by Picasso already in the two pictures of a *Seated Woman* of 1926 and 1927.[39] But here, the combination of the elements was brought about by the superimposition of various planes which destroyed the unity of the object as object. A step further in the development is shown in the *Girl before a Mirror*[40] of 1932 where the diffuse effect of a mere superimposition of fragments of perception is overcome by focusing the fragments in an ornamentally unified object.

In the so-called "double-face" heads of 1937–1939,[41] Picasso has reached a final solution of the problem. The elements with which he works are visual perceptions received through both close distance observation and movement of object and spectator. The result of close distance observation is that the human face appears to the spectator like a landscape which he cannot take in at a glance. As his eyes are wandering over the close object, his vision is condi-

[38] Hildebrand, loc. cit. p. 22.
[39] Barr, loc. cit. pp. 132, 134.
[40] Barr, loc. cit. p. 156.
[41] Barr, loc. cit. pp. 185, 187, 190.

tioned by two factors: because the object is so close there appears in each of the observer's eyes a picture throughly dissimilar to that of the other eye. As the eyes wander over the face-landscape it is obvious that the forms of the face as they are protruding and receding in space, are seen in various perspectives. One must only add the movement of the observed object and/or of the observer's head or body to see how diffuse space perceptions become under these conditions.

Hildebrand realized what the adjustment to a new mode of space perception means to the individual observer. He remarks that it is very difficult to "understand the influence which every alternation in the welding together of visual elements must exert in the harmony of our ideas."[42] "It is out of such experience," he goes on, "that the fund of artistic tradition is made up." Out of a new predominantly kinesthetic space perception Picasso has developed the fundamentals of an essentially new idiom in painting. It is for this reason that his art seems to be unintelligible to so many people today. As soon as the new concepts governing his art will be common good, his painting will be as intelligible as any artistic idiom of the past.

The time-space continuum in painting and science. It remains now only to give an account of the integral role that the time component plays in this new artistic concept, and of the possible connection it may have with current scientific theories. "Until now," Apollinaire[43] says, "the three dimensions of Euclid's geometry were sufficient to the restiveness felt by great artists yearning for the infinite. . . . Today scientists no longer limit themselves to the three dimensions of Euclid. The painters have been led quite naturally, one might say by intuition, to preoccupy themselves with the new possibilities of spatial measurement which in the language of the modern studios are designated by the term: the fourth dimension."[44] And Einstein says:[45] "That there is no objective rational division of the four-dimensional continuum into a three-dimensional space, and a one-dimensional time continuum, indicates that the laws of nature will assume a form which is logically most satisfactory when expressed as laws of the four-dimensional space-time continuum." It seems that the only possible procedure of integrating the kinesthetic with the visual experience in painting is by breaking through the absoluteness of Euclidean geometry, and by re-assembling the shattered fragments of visual perception on the basis of their temporal cohesion. "According to the Theory of Relativity the geometry valid in the universe is not defined a priori as with Kant who took space and time as categories of reason; rather, this geometry is first defined by physics."[46]

In spite of the ostensibly intellectual and cerebral character of cubism, it would be completely misleading to assume that the change in the pictorial idiom

[42] Hildebrand, loc. cit. p. 72.

[43] Apollinaire, loc. cit. p. 12.

[44] Apollinaire, loc. cit. p. 12. The editor makes a note here saying that "Apollinaire is obviously using the term 'fourth dimension' metaphorically." While it is obvious that the painters using the term in the studios at the time of Apollinaire's writing could have no exact knowledge of what was scientifically meant by this term, our considerations make it very doubtful that they used it merely in a metaphorical sense.

[45] Albert Einstein, *The Meaning of Relativity*, Princeton, 1923, p. 33.

[46] H. Schmidt, loc. cit. p. 55.

was a result of purely theoretical deliberation. It may very well be argued, however, that the introduction of non-Euclidean geometry into physics on the one hand, and the breaking away from occidental perspective on the other hand, are correlative movements in the evolution of the western mind. Furthermore, the new pictorial idiom created by cubism is most satisfactorily explained by applying to it the concept of the space-time continuum. That this explanation is legitimate is at least indicated by Apollinaire's references to non-Euclidean geometry and to the fourth dimension.

To sum up, the following points should have become sufficiently clear by our previous considerations:

The reason for the dissolution or distortion of the object in painting is not the same for the fauves as for the cubists. In fauvism, the object is "distorted" for the sake of subjective "expression," while in cubism it is being distorted in the process of a search for new objective categories of representation.

These new objective categories must be sought in an insistence on the portrayal of kinesthetic experiences hitherto not consciously experienced as integral factors of visual perception, and not considered as essential factors of pictorial representation.

The principle integrating visual and kinesthetic experiences in painting implies some concept of a space-time continuum.

The integration of non-Euclidean geometry with the fourth dimension is a constituent factor in contemporary physics. This happened in physics at exactly the same time as the change to cubism happened in painting (Einstein, *Special Theory of Relativity*, 1905; Minkowski, 1908; Picasso's first cubist picture, *Les Demoiselles d'Avignon*; 1906–07).

"Distortion" in painting and science. If it is correct to assume that the "distortion" of the object by the cubists is not willed but, quite to the contrary, the result of a distinct process of perception, then it should be possible to give an objective account for these distortions. Quite obviously, the pictorial organization of a temporal, kinesthetic sequence of perceptions cannot lead to the same visible results as are to be expected from an arbitrary elimination of the kinesthetic idea. From a completely different point of view the theory of relativity offers a very plausible explanation of the same fact. According to the theory "the ideas of absolute length, of absolute space, and of an absolute and even flow of time, are metaphysical concepts which go far beyond what is indicated or justified by observation or experiment."[47] Similarly, Apollinaire[48] says of the cubists: "Wishing to attain the properties of the ideal to be *no longer limited to the human*, the young artists offer us works which are more cerebral than sensual. They discard more and more the old art of optical illusion and *local proportion*, in order to express the grandeur of *metaphysical forms*." Assuming (though wrongly) that the absoluteness of time and the absoluteness of space were facts verified by physics, Apollinaire rejected them for the sake of "metaphysical form." Hardly could he suspect that, at the time of his writing, the content of his metaphysics was already an essential part in the theory of physics.

[47] Dampier, loc. cit. pp. 420, 422.

[48] Apollinaire, loc. cit. p. 12.

This similarity of content should not hinder us, however, from seeing that—in accordance with the distinct functions of art and science respectively—the artistic concepts *are* metaphysical while the scientific hypothesis *is* a theory.

To pre-relativity science time and space were absolutes; this concept, regardless of whether it was understood in a metaphysical or in a purely theoretical sense, was sufficient for the pursuit of its objectives. To the theory of relativity the space-time continuum is a necessary construct in the explanation of phenomena otherwise not explainable. But the time-space continuum must become a metaphysical concept if it is to be operative outside the realm of pure physics. It is, in the opinion of many thinkers on the subject *the* metaphysical concept needed to change the minds of humans in such a manner that they can become creative in our present environment.[49] This new concept means but one thing: that our attention has shifted from the static and mechanic aspects of our environment to its dynamic and energetic aspects. It "reveals the reciprocal and mutual modifications caused by supposedly inanimate objects."[50] Painting, through cubism, has created a new idiom capable of emotionally implementing this new concept. It is for this reason that I would suggest expanding the meaning of the term cubism to comprise all manifestations of that type of painting which is concerned with the integration of kinesthetic experiences.

"So far, then, we see that the old ideas regarding the measurement of length, time and mass involved an 'idealistic' notion of 'absolute time' which was supposed to be the same for all observers, and that Einstein introduced a more practical notion of time. . . . This led to the discarding of the idea that the length of an object is a fact about the object. . . . Hence we may say that *length* is *not* a *fact* about an *object*, but rather a *relationship* between the *object* and the *observer*. And similarly for *time* and *mass*.[51] Just as time was supposed to be the same for all observers, so were length and mass. However, the "distortion" of the object, i.e. the change of its proportions in cubist painting, should be admitted much rather on the basis of this physical (or metaphysical) knowledge than on the basis of a subjective need. One may very well say that, physically speaking, the object appears with the same proportions to you and me in a man-size world.[52] The painter, however, and with him the observer of the painting, transcend their individual restrictions, experiencing the world in a new and hitherto unknown unity. They are no longer *limited* to their human *isolation* and to a *local* relationship but are themselves integrated into a universal relationship. *The object of the painting is no longer an infinitesimal point in time manifest in an infinite space, but an event in time manifest in a finite space.* ". . . we live in a four-dimensional world. This does *not* mean that we live in four-dimensional space, but is only another way of saying that we live in a *world of events* rather than of *points* only. . . ."[53]

[49] L. Moholy-Nagy, *Vision in Motion*, Chicago, 1947. Alexander Dorner, *The Way Beyond Art*, New York, 1947.

[50] Gleizes, op. cit. p. 16.

[51] L. R. Lieber, *The Einstein Theory of Relativity*, Part I, 1936, p. 25.

[52] *Magazine of Art*, March 1948, Letters to the Editor.

[53] Lieber, op. cit. p. 49.

The only way in which the time component, the event-quality, or the kinesthetic experience can be incorporated in the pictorial representation of an object is by breaking up the local measurements of the object as they may be obtained by a one-observer-one-object relationship. Whether we say that observer and object are moving relative to each other or that the observer is potentially omnipresent in time *and* space remains the same. This is what Boccioni means when he says: "Painters have always shown us things and persons in front of us. We shall place the spectator at the center of the picture. . . ."[54] As is true with humans, the creative observer or artist will always have to work with fragments of actuality. In order to re-make these fragments into a spiritual reality, he has to re-assemble them in a certain order. The fragments of reality which he proposes to utilize for his organization will be picked according to the needs of the kind of order he wishes to establish. Or, reversely, the kind of fragments he picks will condition the kind of order among them that he can establish. It was through this reciprocality of percepts and concepts that cubism developed. If we perceive it correctly, that is, primarily in a kinesthetic fashion, we can understand its concept, and if we understand its dynamic concept we are on the way of perceiving it according to its own standards.

[54] Goldwater, op. cit. p. 436; written in 1910.

REVIEWS

DE TOLNAY, CHARLES. *Michelangelo, Volume II: The Sistine Ceiling.* Princeton 1945, Princeton University Press, pp. 285, 416 ills., $17.50.

Note: The publication in summer, 1948, of Charles de Tolnay's third volume in his *Michelangelo* was at once marked in the more dignified segments of the popular press with a respect befitting its grand scale, complete corpus of handsome plates, and the Princeton Press imprimatur. Since that time the sizable group of people, not expert or self confident enough to pass personal judgment, but too professional to proceed upon faith, has settled down to its usual wait of a year or so for the scholarly reviews.

While doing so, some may like to refer back to previous volumes and to the reviews of them. In so doing they will discover the odd fact that apparently no "scholarly review" of the second volume appeared at all in the United States, an extraordinary phenomenon in the case of a publication so obviously "major." Delving further back, they may be led to deduce correctly that this silence was due to the acrimony, at times approaching the personal, that surrounded the reviews of the first volume and Mr. Tolnay's replies to them. Such a tone, while naturally making the small community of Michael Angelo specialists hesitant, is regrettable for the progress of these studies.

The notes below on the *Sistine Ceiling* have, then, some sort of justification at this late date. Coming before the reviews of Volume III they will perhaps interest some readers, and the writer, concerned to see whether they apply to it. The fool rushing in has modified, if not amended, his foolishness by applying himself solely to problems of general procedure and conclusions, and not to the intricacies of specific philology.

In this newest book on a work of art often called the world's greatest, most readers will begin with the reproductions. They will find them excellent, superseding the most available competitor, the Phaidon *Paintings of Michelangelo.* Clear and large, they eschew dramatic gloom and shocking detail (it is precisely the photograph of a work of art that

should not try to be a work of art) and are the completest set existing. It is almost enough to say that the bulk derives from Anderson photographs.

The text is only for professional researchers in the history of art. This is obvious from constant quoting in foreign languages and the number of complexly organized footnotes, to name only outward tokens. As such, its function is to absorb into the total view the new facts and ideas presented since the last general studies, by Steinmann and Thode, and, thus enriched, to present a new total view which will at once be historically accurate (and here it is unlike art criticism) and by analysis "realize" our admiration.

Tolnay is well equipped to handle new additions to factual knowledge. His early and important Michael Angelo studies edited unpublished materials. On such a well studied artist only minor scraps are to be expected, but Tolnay contributed considerably by substituting for his predecessors' criterion of aesthetic importance one of scientific completeness. This accounts for such a valuable feature of the book as the many reproductions of little known ornamental sections.

But in general for Michael Angelo, and most of all for the ceiling, the raw materials have long been in order. The only really new documents throw an odd light on Tolnay's situation: when Michael Angelo's addressees received his letters, they jotted down the contents on the back. Nothing is added to our knowledge and all previous scholars have ignored these notations, though knowing about them. Tolnay, in publishing them first, points out his scoop not only in the preface but at every recurrence. This is regrettable because it can lend color to the eternal philistine view that scholars work not to enhance truth but to show off their knowledge.

Curiously at odds with these minutiae is the fact that the major documents are published, in numerous cases, only in extracts, a cardinal sin in scholarly monographs. Why the reversal, wiping out the value of the book as a work of reference that could be used as a standard text without reference to others? The fact that the documents are all available (in out-of-print books) is of no consequence. In conjunction with the tendency noted above, the only visible reason is the disturbing one that only thus could novelty be attained. Where then is the raison d'être of this elaborate publication? If not in its value as a work of reference, then one must look for it in the aesthetic interpretation, which is indeed novel, complex, and challenging.

This interpretation derives from twentieth-century thinking styles in an involved way. In so cramped a space a step-by-step proof is impossible; the reader will be asked to hold his breath while a broad conclusion is offered arbitrarily and numerous quotations cited in support. Tolnay, then, belongs to a school whose most famous exponents are Bergson and D. H. Lawrence. Roughly speaking, he opposes positivism and science as too abstract, materialist, and rationalist, praising the dark forces of nature which are wise by instinct and intuition (not reason), endlessly creative, dynamic, organic (not structural), working through the rhythmic cycle of birth and decay, growth and death. Warm enfolding Nature opposes and redeems the petty mechanisms, so that time, for instance, may be called either a set of measured minutes (bad) or a continuum (good) related to the forces of destiny. The development of psychology, with its emphasis on sex, the irrational and the subconscious, harmonizes with these views. For Tolnay, High Renaissance painting in general is like this: "Not only is the human figure conceived as an organism in itself developing according to the laws of vegetal growth and pulsating from its very life stream, but the work of art in its totality, i.e. the figures, space and architectural setting taken together, is conceived under the organic principle that the differentiated elements form the members of a higher organism which itself pulsates with the same musical and rhythmic life." The lack of concreteness becomes plain when we try to decide for ourselves whether Giotto or Rubens shows more or less or different "pulsation" from the High Renaissance.

Now the success of modern psychology makes us pause before decrying such a statement. Tolnay may be able to prove that he has found the key to Michael Angelo's attitudes. But there are two difficulties. First, he undermines himself by declaring these to be the *conscious* motivations, not merely the instinctive drives, involved. In our knowledge of sixteenth century culture there is no evidence for the anticipation of Freud, and much lead-

ing in other directions. But Tolnay writes: "He (Michael Angelo) emphasized the fact that they are grieved by the apprehension of his tragic fate. Noah is a kind of presage of death." And "The representations which he made of the absolute being as attaining more and more to perfection were, in his conception, the exaltation of the free, sovereign and spontaneous act to which his promethean soul aspired." And "His theme is the eternal stream of humanity." These terms—he conceived, he emphasized—are casual, and indeed Tolnay never treats the question of whether Michael Angelo's supposed Bergsonianism was conscious or not as a problem.

The second difficulty is that, not only does Tolnay exalt the organic principle as a theme, he utilizes it to the exclusion of Euclidian demonstration in his actual method. His proof that Bergsonianism existed is a Bergsonian type of proof. This means that he simply asserts intuitively, without requiring justification. He will lay two statements side by side, thus: "The woman dominates this scene: it is the age of the gynaeocratic system." Since Michael Angelo, even unconsciously, could not have connected the ancestors of Christ with the matriarchal theory, this statement has status only in Tolnay's emotive associations. With all the learning and sophistication, this is a return to "impressionistic criticism" with all its qualities. That instance is a small but perfect case; others deal with larger issues. We are asked to read the ceiling from the latest story (Noah) to the earliest (Creation) because then it will illustrate the neo-Platonic doctrine of the ascent of the soul. Since the literal order illustrates the fall of man, the results tally. The theory only recalls the systems for reading Shakespeare that reveal Bacon's code; if we use the system we actually find the code, and from the Baconian's point of view that proves him right. That Michael Angelo intended this system, as amazing as reading Tolnay's book straight through from last paragraph to first, is shown by nothing except that he was a neo-Platonist. (If we agreed that Michael Angelo was painting neo-Platonism, we would still have the problems that his interest in it is best shown twenty-five years later, and why he worked against the harmony of Plato and Christ that neo-Platonists always tried to prove.)

Another case in point is Tolnay's solution of an old problem: why do the prophets occupy the specific places they do? The old theories are awkward, and the notion, in keeping with current views, that each is connected doctrinally with the nearest scene, is likely enough. But the specific evidence is startling: Zechariah is near the scenes of the Fall because he said "The Lord hath been sore displeased with your fathers. . . . Turn ye now from your evil ways." Ezekiel is by the Creation of Eve "where God appears for the first time" (reading backwards) because he said "The Heavens were opened and I saw visions of God." Without any sense of what is commonplace and what special in each prophet's writing, Tolnay has evidently opened the Old Testament and hunted parallels, and his analogies are extraordinarily loose. The strangest is Jeremiah: "Before I formed thee in the belly I knew the . . ." which goes with the First Day of Creation "representing in Michelangelo's interpretation the very birth of God himself." That a sixteenth century Catholic should be thought to "interpret" God as having a birth shows a remarkable lack of historical sense and willingness to allow the Bergsonian theme to wash away Michael Angelo.

When a statement is backed up, it is by reference to a previous statement as often as not. The interlocking of assertions is parallel to Tolnay's method in writing letters objecting to criticism (which he does more than any other reputable scholar), in which he tends to answer by repeating the statement which had met criticism. Such logical method is incomprehensible unless one realizes that the whole fabric is built on intuitive belief which is regarded as of absolute value. This is hidden by Tolnay's well-trained and very capable understanding of the received methods of editing documentary material.

When Tolnay makes an intuitive interpretation of a work of art in his writing, the very intuitiveness makes it hard to show its error, and this has made the role of his critics difficult and his own in answering them easier. But when he adopts the method in interpreting a piece of writing, the identity of terminology makes it possible to show how incorrect is his inference. The reviewer has undertaken such a task previously in connection with one of his glosses of Michael Angelo's poetry; here one striking gloss on an earlier critic of the artist which he makes in the book may be adduced. "Montegut correctly observes that

it is the coloring that takes away the heaviness of the plastic forms and makes the huge figures appear to be hovering above the chapel." Now Montegut's sentence had been quoted directly above; it does refer to the taking away of heaviness but has not a word about the hovering. That is Tolnay's emotive insertion.

With this in mind we may examine his direct observations on the works of Michael Angelo which appear to involve similar emotive insertions. Italics are the reviewer's. "In his group Victory he embodied even more clearly this 'necessity' of the triumph of youth over age, *the manifestation of the life-cycle of nature.*" "God the Father's body is escorted on all sides by a cohort of Genii, who gather about him *like children around their father.*" "The pairs of putti . . . were conceived as parts of the architectural system. . . . *They are to be conceived as personifications of the vital forces stored in the stone.*" In no case is any evidence produced to show that this is the artist's program; but in every case it clearly enhances the attractiveness and stimulus of the ceiling for the writer. The ancestors of Christ are interpreted as suffering from the classic modern neuroses, anxiety, melancholy, and distrust. In short, Tolnay constantly blends his objective report with his feeling about it—for him, the absolutely correct feeling. There is no methodological concern with the relation and interplay of these two factors.

This forces one to find the book a failure in interpretation. It may be argued that though for anything that is shown these factors are foreign to the painter, they form the most fruitful approach for the modern spectator. Yet if, as all parties assume, the ceiling is a great work of art, its painter was a master of his vocabulary and has a universal message for us, a message, therefore, inherent in it and waiting to be evoked, not to be found in our extraneous feelings called up in the presence of its greatness. The case is sadder in that the author's direct sensitivity is keen and articulate. His immediate reactions to the plastic structure and the color are revealing. We could use his talents. But the ideology being a whole philosophy, how can he be asked to cast it aside?

It should be noted that the book is wildly overpriced. Editorial care could have reduced greatly its sprawling design, which makes it look monumental but hampers all use.

CREIGHTON GILBERT

GIEDION, SIEGFRIED. *Mechanization Takes Command. A Contribution to Anonymous History.* New York 1948, Oxford University Press, pp. xiv + 743, 501 illus. $12.50.

The overwhelming wealth of material in Dr. Giedion's kaleidoscopic book makes it hard to convey its content completely. Facts and trends, patents and tastes, dentists' chairs and late mediaeval miniatures, artificial insemination and skating on artificial ice, baking of bread and improving vacuum cleaners are interwoven into a monumental canvas of mankind's struggle for, with and against the machine. Thus it is quite natural that the tremendous scope of this enterprise makes it impossible for the author always to follow consistently the historic, the technical, the sociological, or the aesthetic approach. There is something of Lewis Mumford, something of Herbert Read, and—although the author probably would not like to admit it—a little of John Ruskin in Giedion's conclusions. They are drawn from his observation of the steadily increasing power of the machine, which ends in the glorification of the gadget and the standardization of the human mind. What begins as an aesthetic analysis of the capture of movement in modern art, juxtaposing Kandinsky's, Paul Klee's and Fernand Leger's creations with speed-photographs, graphs, etc. becomes gradually a history of the world's patent offices, especially of the United States patent office. The history of civilization through the last two hundred years unfolds as a history of technique, the history of human society becomes a history of invention. And the influence of mechanized tools—"tools" in the most general sense of the word—on human behavior and the psychology of man is deftly analyzed. The fascinating quality of the book lies in its surprising and astonishing juxtapositions of biological, psychological, sociological and aesthetic facts, and in the tremendous variety of human activities which are discussed. We must be grateful to Dr. Giedion for having stimulated research into entirely new fields and an entirely new and original approach.

After discussing the "Springs of Mechanization" and the "Means of Mechanization,"

such as the development of the lock, from handicraft to mechanical production and the evolution of the assembly line, Giedion discusses how "Mechanization Encounters the Organic." The mechanization of agriculture, of baking bread, of slaughtering and packing, climaxes in the "Mechanization of Death" and the "Mechanization of Growth"; the neutralizing mass transition from life to death is juxtaposed to artificial insemination.

The most stimulating section, from an aesthetic point of view, is part V, "Mechanization Encounters Human Surroundings" a heading under which the history of furniture is presented from the technical viewpoint, beginning with Ancient Egypt and going through a discussion of the dentist's chair, the Pullman seat, etc. to modern furniture by Alva Aalto and other designers. When "Mechanization Encounters the Household," we are not astonished to find that the kitchen sink, the ironing board, the washing machine and the refrigerator are analyzed with the same care. An extremely interesting chapter on the "Mechanization of the Bath" ends the factual part of the book.

Slightly dizzy, one leaves these chapters to turn to Giedion's conclusions. He asks, in agreement with Herbert Read, for a "dynamic equilibrium," i.e. for an "equipoise," between the rational and the irrational, between the temporal and the eternal, between the human body and the cosmic forces. In simpler language, the standardizing influence of mechanization must be counteracted by a new emphasis on the intrinsic values of earth and growth, on emotion and personality.

It would be pedantic to criticize in so large a project specific statements or conclusions. One has to recognize the originality of the book's basic idea, which certainly will stimulate even those who do not agree with Giedion's conception of the philosophy of history.

PAUL ZUCKER

LEWIS, CECIL DAY. *The Poetic Image*. New York 1947, Oxford University Press, pp. 157, $3.00.

Why does Mr. Day Lewis feel it necessary to devote the first two pages of this book to a coy reluctance to appear in the rôle of critic? He has himself written criticism before now, his book *A Hope for Poetry* being a noteworthy instance. And his pretence that the realm of criticism—"a world of law and logic"—is utterly strange to the poet (and, inferentially, not particularly relevant) is not a compliment to the authorities of the University of Cambridge who had invited him to deliver these Clark Lectures; for those who at sundry times in 1946 assembled to hear Mr. Day Lewis scarcely expected to be regaled with instalments of a new *Prelude* or *Don Juan*. If Mr. Lewis thinks critics are all rather funny and inept people, why doesn't he leave criticism alone?

That he chose not to do so is evidenced by the remaining pages of this book, which, though not in any way startling or revolutionary, contains much good sense set forth in a pleasantly unobtrusive prose, refreshingly unlike the hedgehog diction in which some of our more austere critics armor their thoughts. The main intent of the book, I take it, is mediatorial. Mr. Lewis is troubled by the gaps of incomprehension that divide the poets of today from the readers of today, and by the no less discernible cleavages that seem to separate the various experimentalists of recent times from the technique and idiom of poets working in the main tradition of European poetry. Through a consideration of the nature and functions of the image in poetry, Mr. Lewis hopes to fill in the former gaps—between poets and their readers—and to show that the aims and methods of many experimental poets are not so diverse from those of their more traditional brethren as differences in the surface glaze and texture of contrasting poems might suggest.

When in the first chapter, "The Nature of the Image," Mr. Lewis essays to define the image, he is not, he admits, particularly satisfied with his own efforts. "In its simplest terms, it is a picture made out of words." Yet Mr. Lewis feels that so simple a definition does not indicate that about which he wishes to talk, so he amplifies the definition to "the poetic image is a picture in words touched with some sensuous quality." Yet neither will this do; for it admits the advertising copy-writer into the charmed circle. So Mr. Lewis tries again: "a poetic image is a word-picture charged with emotion or passion." Yet on the next page, he tells us that "I would distinguish, in fact, between human emotion and

poetic passion," and we are off again. But here the particular trail of the definition becomes lost in a maze of subsidiary issues, and is not again picked up until the last chapter, where it appears momentarily in the remark that word-pictures *"only become images in relation to a general truth"* (Mr. Lewis' italics). Yet (returning to the first chapter) "the image is the constant in all poetry, and every poem is itself an image." Hence we must learn what we can about the image, defined or not. What we do learn in the rest of the first chapter is that images interest us by possessing attributes or functions which Mr. Lewis calls "precision" and "revelation." With the latter word as a point of departure Mr. Lewis then rapidly sketches a kind of metaphysic of the image, of which the following passage is a characteristic sample:

> . . . every image recreates not merely an object but an object in the context of an experience, and thus an object as part of a relationship. Relationship being in the very nature of metaphor, if we believe that the universe is a body wherein all men and things are "members one of another," we must allow metaphor to give "a partial intuition of the whole world." Every poetic image, I would affirm, by clearly revealing a tiny portion of this body, suggests its infinite extension.

And so, after a brief excursus contrasting "the classical and modern views of poetry—the classical which thought of it as making horrible things pleasing, the modern which sees in it the acceptance of the horrible as part of a pattern," the chapter closes with the declaration that "The poet's task . . . is to recognize pattern wherever he sees it, and to build his perceptions into a poetic form which by its urgency and coherence will persuade us of their truth."

In chapter II, "The Field of Imagery," Mr. Lewis says that "What the moderns look for in imagery, I suggest, is freshness, intensity, and evocative power." He thinks the first two of these can be "gauged by objective critical standards," whereas the last is susceptible only of "the individual, subjective test." (There is of course plenty of room for objection at this point. So far is Mr. Lewis' distinction between "intensity" and "evocative power" from being well-grounded that he himself continually slides from a premise about "freshness" into a conclusion about "evocative power" without noticing that he has done so.) The rest of the chapter uses these distinctions as key terms in the exploration of the practice of different kinds of poets. The following chapter, "The Pattern of Images," considers in general the kind of selectivity, and the mode of its functioning, by which the poet's imagination chooses the images destined to go into a poem from the mass of heterogeneous possibilities which may cross his mind. Chapter IV, "The Living Image," discusses the materials from which the poet today constructs his images, and analyzes the kinds of resistance to the language of imagery likely to be encountered in the average "educated" reader. Mr. Lewis stresses his belief that the poet through his image-making faculty is performing the same sort of interpretation and humanizing of the world which was once achieved by myths, and which is no less necessary for spiritual poise and maturity in an age when myths are no longer credited. Chapter V, "Broken Images," considers, largely through analyses of sample poems by Dylan Thomas, Gerard Manley Hopkins, George Barker, and David Gascoyne, the conditions which must obtain in a poem as a whole if energetic and even seemingly discordant images are to achieve the condition of being a poem—of exhibiting that "wholeness" which, Mr. Lewis tells us in chapter III, "lies, surely, in imaginative statement which creates a pure imaginative response reaching out beyond the limits of a theme towards human experience on all sides, yet at the same time perfectly satisfied within those limits." Mr. Lewis' final chapter, "The Eternal Spirit's Eternal Pastime," is, as its title suggests, rhetorically rather than dialectically pertinent. It is both too speculative—he flirts with Miss Maud Bodkin's Jung-ian notion of "archetypal patterns" of racial experience which, unrecognized by the poet, endow his greatest passages with their potency—and too admonitory—the last three pages are an appeal to the young poets of day-after-tomorrow to "Be bold, be bold, but not too bold, and above all be human," if I may presume so to condense Mr. Lewis' counsels.

A few minor features of Mr. Lewis' book I find disquieting. One is a too great hospitality to the dicta of a rather miscellaneous assortment of critics whom he quotes. As a result,

some of Mr. Lewis' own key terms become tremulous in outline when stared at closely, betraying some instability in their origins. I also cannot share Mr. Lewis' enthusiasm for the imagery of George Meredith. He finds it singularly "evocative"; to me a good deal of it seems close to the banal. But against these minor criticisms I must set the conspicuous merits of the book. It is valuable because its comments on well-known poems by recent poets are themselves the observations of a practising poet, whose poems, though never extreme in their technique, have nevertheless been connected with some of the "modern" developments in English poetry. And the book is valuable because Mr. Lewis brings to the task of literary criticism a quality, the lack of which to my mind often seriously mars the criticism produced by critics who in analytic power and suggestive brilliance outshine Mr. Lewis. The quality to which I refer is good temper. It always makes for pleasant reading; and it makes its possessor immune to some critical extravagances from which brilliance alone would never save him.

F. Cudworth Flint

Bukofzer, Manfred F. *Music in the Baroque Era from Monteverdi to Bach.* New York 1947, W. W. Norton & Company, Inc., pp. xv + 489, 12 plates, 105 musical examples.

A new book in English on baroque music by a competent scholar is a most welcome addition to the rapidly growing body of serious musicological publications in the United States. Used by the reviewer as a text in a summer session seminar on baroque music, the volume proved its value as a guide to the many and complex problems of the period. Among the features which contribute toward making it especially significant and useful may be cited the following: a concise yet thorough presentation of the principal stylistic trends, skillfully used footnotes leading to the source material, an extensive checklist of baroque books on music, a comprehensive bibliography, a selective list of editions of the music (including general anthologies, historical collections, smaller collections and performing editions, and complete or collected editions of individual composers), numerous musical examples, twelve well-chosen plates, and an index.

The eight central chapters deal with the characteristic musical styles of the early, middle, and late baroque by country, style species, and composer. The persistence of renaissance procedures, the inception of typically baroque ideas, the stylistic fusions and novelties characteristic of the successive divisions within the baroque, the inner unity of the period as a whole,—these and innumerable related factors are presented with judicious selection of detail and acute insight into the overall processes, musical and sociological, which function formatively through the period to make it one of the richest and most varied in musical history.

The final three chapters—"Form in Baroque Music," "Musical Thought of the Baroque Era," and "Sociology of Baroque Music"—contain illuminating discussions of the underlying problems and philosophy of baroque music which should be read both before and after the study of the remainder of the book. In spite of certain apparent inconsistencies, the chapter on form deserves special mention because it makes an invaluable contribution to the understanding of the music of the period. One inconsistency which may be mentioned is in connection with the discussion of the fugue. Early in the chapter Bukofzer quite properly emphasizes the point that form is "not only the external scheme, but also the principle that governs the inner organization of a particular composition." Later he argues that the fugue was neither a form nor a texture but a contrapuntal procedure. Elsewhere throughout the book, however, he quite consistently refers to the fugue as a form.

Of particular interest from the viewpoint of aesthetics is the treatment of the problem of expression in baroque music. Throughout the volume Bukofzer takes into consideration the problem of the relation of text to music. He points out the "affective representation of the words" as one of the essential characteristics of baroque music as distinguished from the "restrained representation of the words" in renaissance music. But it is difficult

to follow him when, after stating that *expressio verborum*, as expression of the text was called at the time, does not have the modern, emotional connotation of "expressive music" and can more accurately be rendered as "musical representation of the word," he goes on to say[1]

> The means of verbal representation in baroque music were not direct, psychological, and emotional, but indirect, that is, intellectual and pictorial. The modern psychology of dynamic emotions did not exist in the baroque era. Feelings were classified and stereotyped in a set of so-called affections, each representing a mental state which was itself static. It was the business of the composer to make the affection of the music correspond to that of the words. According to the lucid rationalism of the time, the composer had at his disposal a set of musical figures which were pigeonholed like the affections themselves and were designed to represent these affections in music.

Later he states[2]

> Nor should these procedures be misrepresented as emotional program music or as the psychological expression of the feelings. The affections were non-psychological, static attitudes and were therefore peculiarly fitted for musical representation.

This must be regarded as an overstatement. It is true, for example, that Descartes lists and describes the emotions as though they were intellectual functions. But it should not be overlooked that he was perhaps the first to attempt a detailed description of the relation of nervous functions to mental processes and behavior. It is further true that in the course of the baroque era composers resorted to a set of stereotyped "figures" which were intended to "represent or depict" the affections in music, and that many of the devices used were intellectual rather than psychological in nature in that they depended upon allegory, metaphor, and simile, as Bukofzer has so ably pointed out in his article "Allegory in Baroque Music."[3] Nevertheless, over and above the intellectual elements in the use of musical "figures" for the "representation" of the affections, the fact should not be disregarded that much of baroque music did in large measure effectively express the emotion or mood suggested by the text with which it was associated. Whether in Monteverdi's *Lamento d'Arianna* or Bach's *Christ lag in Todesbanden*, no one can deny the psychological effectiveness of the expression of the basic mood. It is apparent in many passages in the book, especially in sentences in which the term *affection* does not occur, that Bukofzer is aware of this fact. He refers to a song of Dowland (p. 72) as "steeped in deep melancholy," to the "severity and gravity" of certain works of Sweelinck (p. 75), to the "solemn and hymnic tone" with which Cesti endowed his arias (p. 131), to Stradella's "impassioned melodies . . . in their pathos" (p. 134), to the "sprightly tone" of Purcell's music for the airy and fairy realm of the *Fairy Queen* (p. 211), etc.

In spite of the so-called "doctrine of the affections" and the use of the "figures" in the "representation" of the affections there is substantial evidence that the expression of emotion in music and the psychological basis for it were at least in some measure understood and practiced in seventeenth century music. As early as 1618 Descartes, in his *Compendium Musicae* suggests that the various musical rhythms tend to produce in us affections similar to those of the music in such a way that, in general, a slower measure excites gentle feelings such as languor or sadness and a faster measure, lively feelings such as joy, etc.[4] Hobbes, too, proceeds in a similar vein when, after expressing dissatisfaction with the current and traditional theory of the passions and affections, he develops a dynamic theory based on the concept of "motions" derived from the basic presupposition of

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[1] P. 5.

[2] P. 389.

[3] *Journal of the Warburg and Courtauld Institutes* vol. III (1939–40), pp. 1–21.

[4] *Cf. Oeuvres de Descartes*, ed. by Chas. Adam and Paul Tannery, vol. X, p. 95. Paris, Leopold Cerf, Imprimeur-Editeur, 1902.

his whole philosophy that in reality nothing exists but matter and motion. Bukofzer's failure to take this aspect of the problem of baroque musical aesthetics more fully into account makes his treatment of the era in this one respect misleading. The point is one that would seem to merit further investigation.

GLEN HAYDON

MEIER, GEORG FRIEDRICH. *Thoughts on Jesting.* Edited with Introduction and Notes by Joseph Jones. Austin 1947, The University of Texas Press, pp. xi + 136. $1.50.

Meier's *Gedanken von Scherzen* appeared first in 1744 and then in a second, and so far last, edition in 1754. The book before us is an annotated reprint, with only a few minor changes, of an anonymous translation published in England in 1764. Next to Alexander Baumgarten, G. F. Meier, professor of philosophy in the University of Halle, was the outstanding pioneer of German aesthetics. Both met the literary fate not seldom allotted to men of the vanguard. Their attempts were consigned to oblivion under the impression of the infinitely richer performance of the following generation. The republication of this old book in America, where at present not a single one of the great works of classic German aesthetics can be bought in English translation, is a venture entirely appropriate to the subject-matter—a literary jest of good taste and highly to be commended.

Meier's definition of jest reads: "a sensitive fine thought, concise, produced by a high degree of wit and acumen, and exhibiting something ridiculous or adapted to cause laughter" (20). The first part of the definition, the "sensitive fine thought," must be understood in the light of Baumgarten's theory according to which aesthetic pleasure arises from an intuitive, i.e., non-rational awareness of perfection, and it is this part on which the author enlarges. His book may be described as an able and pleasant application of Baumgarten's principle, studded with a goodly number of rather delightful illustrations. Its weakness consists in its failure to give a significant explanation of the ridiculous or the causes for laughter. The writer dismisses this question after a few helpless commonplaces, apparently because his restricted philosophical vision prevents him from tackling the deeper problems.

Meier intended his book as a guide in elegant jesting. "Such a linking of the theoretical with the practical was something new," the editor writes in his Introduction. I rather think the author's peculiar way of linking practice with theory was something very old and already on the point of being eclipsed by the rise of new ideas. This is true in two respects. First, Meier's elegant jester is a version of Baumgarten's *homo aestheticus*, which in turn is a late transformation of the Renaissance and post-Renaissance ideals of the *uomo universale* and *honnête homme*, and this humanistic ideal is opposed by the German writers of the Wolff School to the pedantry of the *Schulfuchs*. Second, Meier's idea of "science of art" reflects the old conception of the *artes liberales* which straddles the frontier between theory and practice. Soon afterwards, Herder's attack on the idea of "*schöne Künste und Wissenschaften*," and the subsequent work of Kant and his followers were to establish the modern, "aesthetic" concept of art, thereby destroying the basis of the thought of Meier and his contemporaries.

HELMUT KUHN

English Institute Essays 1946. New York 1947, Columbia University Press, pp. x + 222, $2.50.

Part I, *The Critical Significance of Biographical Evidence:* "John Milton," by Douglas Bush; "Jonathan Swift," by Louis A. Landa; "Shelley's Ferrarese Maniac," by Carlos Baker; "William Butler Yeats," by Marion Witt.

Part II, *The Methods of Literary Studies:* "Six Types of Literary History," by René Wellek; "Literary Criticism," by Cleanth Brooks; "Mr. Dangle's Defense: Acting and Stage History," by Alan S. Downer; "The Textual Approach to Meaning," by E. L. McAdam, Jr.

If I am right in assuming that *The Critical Significance of Biographical Evidence* means how biography enters into the criticism of a poem, then a conspicuous feature of three

essays in the first group of four is a lack of interest in the theme announced. Mr. Landa has, I believe, something important to say about the man Swift: that before we accept the voyage to the Houyhnhnms and Yahoos as evidence for the author's depravity or madness, we had better look into the rather dark opinion of mankind expressed in the sermons of Swift and other divines of his era. That is, the evidence of the literary work regarding the author's mind had better be compared to other and perhaps more relevant evidence. Mr Baker, after giving reasons for the traditional emphasis on biography in the study of Shelley's poems, says mainly that the lament of the Maniac in *Julian and Maddalo* was inspired not by one of the unhappy passages in the poet's own life, but by his reading about the madness of Tasso, especially in Byron's poem on the subject. This is a frontal attack, well calculated it would appear, upon the established biographical views, notably those of Professor Newman Ivey White. Not one biographical fact, but another, is the probable origin of what "can hardly be called a great poem"—a poem which in any event is neither improved nor impaired as its origin is shifted. Miss Witt's essay explores the rich politico-literary career of Yeats and the intellectual history which Yeats himself was so careful to expound in poems such as *Ego Dominus Tuus*, in *A Vision*, and in his *Autobiography*. We are told that it is necessary to know this biography in order to "get the hang" of the private symbolism of Yeats' poems. What we miss is a sample of how this is done. The extended discussion of *Ego Dominus Tuus*, for example, is certainly exposition of philosophy, rather than illustration by philosophy of a poetic object.

An essay on the significance of biography for literary criticism ought to contain, it would seem, two elements: not only biography but criticism—so far as these can be related. Of the four essays under consideration, that of Mr. Bush on Milton comes by far the closest to this ideal. If a better case for biography in the reading of *Lycidas* or *Samson Agonistes* could be made, Mr. Bush, one feels sure, would have made it. Mr. Bush does justice succinctly on the one hand to the "few biographical facts" which beyond doubt must enter into a full reading of Milton's poems, and on the other to the impersonality, normality, and classic objectivity by which the poems transcend biography and have their own meaning.

These essays were read during the four morning sessions of the English Institute. It was doubtless rather late to change the trend of discussion when on the afternoon of the third day Mr. Wellek tied into adroitly distinguished bundles: (1) book lists, (2) history of ideas, (3) history of civilizations, (4) deterministic sociology, (5) historical relativism, and (6) history of literature—concluding his essay with the eloquent passage (pp. 119–126) on relativism, absolutism, "perspectivism," and the relation of criticism to history. Rather late, also, when on the fourth afternoon Mr. Brooks actually compared in detail the political situation of 1649–1651 and Marvell's part in it with the attitude toward Cromwell expressed in Marvell's *Horatian Ode*. This was getting down to business—the business of anybody who would show either how biography does or how it does not enter into criticism. Mr. Brooks' conclusion, that in this "normal" instance biography does *not*, was for the English Institute of 1946 perhaps less significant than his demonstration of a method.

Mr. Downer's informative history of the history of English staging and acting reminds us that at least one kind of literary text is realized at successive moments in changing dimensions beyond the author's choice. Shakespeare does not supply the whole of the grave digging scene. There is Colley Cibber with his bushel of mold. Mr. McAdam concludes his brief essay on textual studies with a passage which reduces the issue between criticism and history to brass tacks. "In case of two extant versions of the same work, . . . Which was the author's preference? Not necessarily the later. If the earlier is the *better*, . . . the editor should publish both." It is I who have italicized the tremendous word *better*. Must the critic confess it?—though he is innocent of the wish to reduce literary history to a sludge of semi-anonymous collaborations between authors and editors and printer's devils, yet he is not strictly concerned with the question of who wrote the poem or who wrote any word of it. Milton as dramatic speaker and subject of the sonnet *On His Blindness* must be distinguished from Milton the creative agent. There is often a decided advantage to the critic in dealing with such anonymous accretions as the ballad of *Sir Patrick Spens*. In short, the artifactual character of literary compositions, their expres-

sion as such, is the critic's concern; and this must be distinguished from the person-to-person pragmatic communicative function of words.

W. K. WIMSATT, JR.

BRAYBROOKE, NEVILLE, and ELIZABETH KING, ed. *Translation*. London 1947, Phoenix Press, pp. 120. 10s. 6d. net.

There are critics who take the attitude that poetic translations are either hybrid works, or if aesthetically authentic, they are new poems stimulated by poems written in another language. The question of poetic translation in regard to the dependability of the texture and spirit of the original is a debatable one. A recent translation of Paul Verlaine into English by C. F. MacIntyre is anything but pedestrian; on the other hand, Louis Untermeyer's Heinrich Heine translations seem more Untermeyer than Heine. The lot of the poetic translator is hardly enviable. Of course, he himself is aware of the organic resistance of poems in the process of being transplanted to a foreign soil. The writer of this review translated poems of D. H. Lawrence, Stephen Spender, Allen Tate, John Crowe Ransom and other English and American poets into Hungarian and is, therefore, fully conscious of the translator's inevitable difficulties.

Two English writers, Neville Braybrooke and Elizabeth King, edited a collection of poems translated by various known or unknown poets into English. In the volume classical Greek and Roman, medieval, Renaissance and modern Italian, Portuguese, Spanish, French, German, nineteenth century or contemporary Dutch, Czech, Croatian, Estonian, Russian, Hebrew, Spanish-American and Brazilian poetry are represented. There is more than a measure of truth in the statement that a universal knowledge of poetry reveals the universality of the human spirit, and that the most indigenous material of poetry, in being poetry, transcends provincial or regionalistic boundaries. Consequently—aside from its aesthetic merit—this kind of a book has a functional value; that is to say, an anthology of foreign poetry in English should be a vehicle for the diminishing of prejudices and ignorance in matters that require sensitivity for experience and sensibility for judgment.

The volume discussed here is the second in a series of translated work; the first, a much smaller one, appeared in 1945. It is to be hoped that the editors will be able to continue this series, despite social and economic uncertainties. It is also to be hoped that in future volumes, other nations will be presented too.

JOSEPH REMENYI

SCHOENBERG, ARNOLD. *Theory of Harmony*. Translated by Robert D. W. Adams. New York 1948, Philosophical Library, pp. xviii + 336, $7.50.

"This translation of Schoenberg's monumental work into English is intended as a student edition, for practical use and is considerably abridged from the original. Much philosophical, polemic material has been omitted, but the essentials,—explanations, directions, examples,—have been included. The portions of the text used are those indicated in Erwin Stein, *Praktischer Leitfaden zu Schoenbergs Harmonielehre*." (translator's preface).

In 1911 Arnold Schoenberg published his *Harmonielehre*, a highly conservative book of instruction in traditional harmony. Some ten years later a *Vermehrte und Verbesserte Auflage* appeared, the text of which ran to 507 pages. There are 346 numbered musical examples, many of them perfectly dry examples of the most strict harmony as well as some carefully chosen quotations from Bach to Berg and Bartók. This translation is based on the later edition and a comparison shows it to have 336 pages of text and 299 musical examples. What is offered here is the skeleton on which the *Harmonielehre* is based: a carefully detailed treatise on harmony including a chapter on harmonizing the chorale and ending with all sorts of examples of Wagnerian chromaticism. These last seem curiously poised, ready to show the direction taken by all Middle-European twelve-tone music.

The translation is good but the book is disappointing, for it is precisely the "philosophic, polemic material" which has been omitted that gives the work its real importance. A faithful translation of Schoenberg's more complex ideas as set forth in the original would be difficult but anything less is decidedly not worth the $7.50 which the publishers ask.

Serviceable academic German harmony books are on the shelves of all second-hand bookstores.

The musical examples have been indifferently photographed from the original edition along with the numbers given them there, so that all omissions of examples may easily be seen. The reproduction of the supplement on pages 142–3 is all but unreadable.

CHARLES JONES

LOWRIE, WALTER. *Art in the Early Church*. New York 1947, Pantheon Books, pp. 268, 500 ill., $6.50.

This is an expanded version of the author's handbook on Early Christian art which appeared many decades ago under the title *Monuments of the Early Church*. In an extensive and somewhat rambling introduction the author scrutinizes the different theories about the origin of Christian art, especially those which emphasize its Oriental descent. He once more defends the older and today largely discarded theory of Wilpert and Sybel which derives Christian art from Roman sources. The point of view of the writer is primarily an iconographic one. The entire field of Christian art from architecture to ivories is discussed in its major monuments but the artistic and stylistic problems remain unconsidered. The reproductions are taken mostly from other publications; these are small and cannot give any idea of aesthetic qualities. On the other hand, it is valuable to find a large sequence of reproductions dedicated to details from S. Apollinare Nuovo and the Cathedra of Maximianus in Ravenna, to the ciborium of S. Marco and the altar frontal in Salerno. While not a handbook from the point of view of the art historian, the book can be considered as a valuable supplement to one. A chronological table, as well as an extensive bibliography, increases the value of the well printed and handsomely bound book.

ALFRED NEUMEYER

WARREN, AUSTIN. *Rage for Order*. Chicago 1948, University of Chicago Press, pp. ix + 165, $3.00.

This book is a collection of nine essays on Edward Taylor, George Herbert, Alexander Pope, Gerard Manly Hopkins, William Butler Yeats, Nathaniel Hawthorne, Franz Kafka, E. M. Forster, and Henry James. Professor Warren's thesis is clearly stated in his preface: "It [art] succeeds when there is an equilibrium which is also a tension, where there is a rage waiting to be ordered and a rage to find, or to make, that ordering." The essays, which are clear and well-considered discussions of the nine authors, will be of interest to persons who are widely read in these writers.

FINLEY FOSTER

INTERNATIONAL NEWS AND CORRESPONDENCE

AESTHETICS AT THE TENTH INTERNATIONAL CONGRESS OF PHILOSOPHY

HELMUT HUNGERLAND

The Tenth International Congress of Philosophy met at Amsterdam from August 11th to 19th, 1948. All sessions of the Congress took place in the main building of the University of Amsterdam. There were five plenary sessions, three sessions devoted to problems of UNESCO, and sixty-three sessions of the various sections.

"Aesthetics" was a sub-section of Section III. Other sub-sections of Section III were General Theory of Values, Ethics, and Philosophy of Law. In addition, one plenary session was devoted to aesthetics. The program announced fifteen papers which were to be presented in three afternoon sessions and in one morning session. Professor J. Aler and

Professor R. Bayer presided at the sessions and directed the discussions, which were lively and informative, but suffered somewhat from the fact that not all participants spoke a common language fluently. Not all papers announced on the program were read, and one additional paper, Professor Edman's, not announced, was presented. The following brief account covers abstracts of papers announced but not presented as well as the papers read (with exception of one paper which was announced without an abstract). The main topics discussed in the papers might be classified as follows: I. The relation of aesthetics to philosophy and life; II. The phenomenology of aesthetic and artistic experience; III. The evaluation of art. There was one paper on psychological aesthetics.

I

KURT BLAUKOPF (Vienna): *The Aesthetics of Musical Humanism from Diderot to Hanslick.* (not presented)

"Detailed examination of the ideas in the world of Haydn, Mozart and Beethoven showed that French influence was a factor hitherto largely underrated. . . . There is a direct trend of thought from Diderot to Hanslick. . . . Following this trend we come to the conclusion that the establishment of an independent realm of music *en elle-même* has its foundation in the materialistic aesthetics of the 18th Century and has nothing in common with an idealistic defense of *l' art pour l' art.*"

G. CALOGERO (Rome): *L' Homme et l' Art.*

Analyzing the apparent opposition between art and other activities usually associated with the terms "mankind" and "humanity," it is found that art is primarily an inner experience which does not require extension into practical activity, always a source of dissatisfaction. Art achieves a certain kind of self-sufficiency by withdrawing from the real world; it is a special kind of internalised diversion. The essence of the work of art is the "lyric equilibrium". The opposition between the notion of mimesis and the modern notion of creation can be overcome. Since mimesis involves a universal vision, all art can be said to be creation. In creating pleasures of various types and universal visions, the artist gives man great help in orienting himself towards the ideals of peace.

HERMAN DECKERS (Antwerp): *La Raison Profonde de l'Esthétique.*

Thesis: Aesthetics is the implicit knowledge of absolute being. Demonstration: The idea of being is not an abstract idea. Being as such, i.e., absolute being, since it is not abstract, is a concrete absolute. As a concrete absolute, it cannot be the object of abstract knowledge. It can only be the object of intuition. The intuition of absolute being is an implicit knowledge. All our knowledge knows implicitly God or absolute being. Aesthetics is implicit or intuitive knowledge of absolute being, which is the eternal cause of all things and ideas as well as of infinite beatitude. Aesthetic experience is like an ecstasy and like an incantation, an experience in which we have necessarily intuitive or implicit knowledge of absolute being.

H. ELZENBERG (Torun): *La Personalité Créatrice de l'Artiste.* (not presented)

The "creative personality" of the artist is distinguished from his "social, or practical personality". Both these personalities are derived from the "fundamental personality". The social personality represents a deformation of the fundamental personality, but it does not simply replace it. The creative personality detaches itself from the fundamental personality as an emanation. Three phases can be distinguished in the formation of the creative personality: (1) selection, (2) transmotivation, (3) mythization. The creative personality culminates in a mystic vision of the world. The artist imagines that he is effacing himself before the world, but actually he expresses his soul in it.

F. MIRABENT (Barcelona): *L'Esthétique et l'Humanisme.*

Since aesthetics has relations to psychology and also to logic and ethics, and indeed, finds its basis and goals in philosophy, it can significantly contribute to the solution of problems usually connected with such terms as "man", "mankind", and "humanity" (one of the general topics of the Congress). Art and nature, the two great spheres of aesthetic experience, would be without value for human conduct if it were not for the fact that aesthetics ultimately induces us to metaphysical meditation about art and nature.

LUIGI STEFANINI (Padua): *Esthétisme et Humanisme.* (not presented)

Aestheticism, like humanism, was born in classic antiquity. The true heir of aesthetic humanism is Romanticism. Our present humanism is the offspring of romantic aestheticism. Philosophy which identifies itself with literature and literature which takes itself to be philosophy work together to give meaning to human destiny in the name of poetry. But our present day sensibility differs profoundly from the titanic humanism of Romanticism because our whole interest is primarily directed towards the object rather than the subject. Man needs to conquer his (individualistic) humanity and to establish a mode of coexistence with the humanity of others. Upon the foundation of the moral personality and reason, man joins the humanity of his equals and the reality of the absolute. Thus he dissolves the flattering illusion of aestheticism which, lulling man with the prestige of creative phantasy, would induce him to give up his sense of being elect and the exigency of his metaphysical achievement.

L. VAN DER KERKEN (Louvain): *Le Devenir Interne du Moment Esthétique.*

The aesthetic moment is the revelation of the absolute; in other words, it is the sensible phenomenon illumined from within by its absolute meaning due to an intuitive and immediate apprehension. This apprehension transcends all sense-perception as such, but it is not yet in the form of an explicit judgment of value and reality. The aesthetic moment is the pure encounter of object and subject. Externally the aesthetic moment appears in the reciprocity of object and subject; internally it is diversified in intuition and feeling. These opposites are nothing but the specific aesthetic translation, the insertion of the aesthetic moment into the totality of human life.

II.

J. ALER (Amsterdam): *La Vérité de la Poésie.*

Axiology rigorously circumscribes the domain of art as that in which beauty is realized and thus separates it from the other regions of value. Nevertheless, aesthetic experience includes other values. Poetry is the art of words, and hence the question of truth or falsity arises in the analysis of poetry. Truth may be understood in two ways: objectively as "conformity to reality" or subjectively as "sincerity." However, both these meanings are incomplete without consideration of a third meaning, which is established in a relationship between reader and poem. In reading, the reality of the reader's life is suspended, while at the same time there is a tendency towards positive feelings. These feelings are pleasurable and while of a sensuous nature cannot be reduced to the sensuous because understanding also plays a rôle in the experience. The world in which poetry exists has its own reality; it is accessible to a specific form of reflection—the aesthetic experience which is a fact of consciousness. The comprehension of poetic reality involves a purification of the self. In this process resides the objectivity which is peculiar to poetic truth.

RAYMOND BAYER (Paris): *La Naissance du Poëtique et l'Age des Valeurs.*

Aesthetic values (operational as well as technical) are instrumental values and as such distinct from poetic values. There is a parallel between the poetic world and the birth of values within ourselves in adolescence (adolescence being definable as the "age of values"). There are three characteristics of all values which explain the transformation of adolescent thought: (1) values are transformations of appetites, (2) values have a social reference, (3) values are qualitatively incomparable. The following typical characteristics of the adolescent exhibit the above traits: (1) the awakening of love, (2) the growth of gregariousness, (3) the adolescent courage, (4) the interest in sports. In these value phenomena of adolescence some characteristics of poetry are discernable: (1) timidity in action, audacity in imagination, (2) oscillation between self-confidence and withdrawal, between meditation and expression, (3) dreaming, nostalgia, evasion, (4) values not established by rules but by models. During adolescence man becomes aware of values and of poetry, and at that moment he becomes a bearer of myths.

IRWIN EDMAN (New York): *The Consequences of Art for the Traditional Categories of Philosophy.*

"In an analysis of the arts, the issues arising in the traditional distinctions between ap-

pearances and reality, the one and the many, means and ends, time and eternity, all are illumined by the meaning these terms have as a function in an analysis of our experience in the arts. A work of art, for example, is at once an illusion and a reality. It is illusory in so far as it is not the object which it represents. It is a reality in that it is in itself an object and also in the sense that it is 'felt' to be more real than many other kinds of objects." This kind of analysis is carried out for the other categories mentioned above.

VLADIMIR JANKÉLÉVITCH (Paris): *Du Sérieux.*

Compared with the two extreme opposites the Comic and the Tragic, the Serious, at first sight, does not seem to offer any distinguishing characteristics. The Serious appears as an equilibrium between two extremes, two barbarities equally orgiastic and dionysian. It occupies an equidistant position but not a position of indifference. The Serious is distinguished from the Tragic which, in the last analysis, is not truly serious. The Serious is also to be distinguished from Irony and should not be mistaken for the Moderate and the Mediocre; it may be compared with Aristotle's mean. Between suffering, which is empirical, and death, which is metempirical, the Serious, holding the middle position between these two, must be taken seriously, but the Tragedy need not be taken tragically, Tragedy should be taken seriously.

III.

ALEXANDER B. GIBSON (Melbourne): *Dogmatism and Scepticism in Aesthetics.*

"The traditional method in aesthetics has been to define the aesthetic phenomenon in terms of a single character. It is said, for example, that art *is* significant form (Clive Bell); that art (or beauty) *is* expression (Croce); . . ." etc. "The common feature of all these definitions is that they are dogmatic: they reduce aesthetic excellence to a single formula. . . . These definitions are supported by a wealth of empirical corroboration . . . nevertheless they are open to two main objections. They rest upon, and in turn encourage, regrettable critical practices; and they take for granted, without inquiry, that there is one character, or one only, or only one intrinsically, which is aesthetically excellent." It is suggested that "there are many excellences, and they hold in all situations. . . . [that] there is no pre-established harmony of excellences . . . [but] in various works of art they are found differently distributed. . . . A great work of art controls and balances in its concrete individuality excellences any one of which is an excellence independently, which cannot be counted upon to coincide and which cannot in general terms be arranged in a fixed order."

HELMUT HUNGERLAND (Piedmont, Calif.): *Art Criticism as Social Argument.*

The question which a theory of art criticism should solve is *not* whether comparative value judgments and standards of evaluation are possible, (since they do take place and are socially necessary) but to evolve an approach which facilitates evaluative comparisons *without* falling back upon a system of absolute and universal values. It is assumed that the aesthetic value of a phenomenon cannot be defined independently of the satisfaction of a percipient's expectations. The expectations are expectations concerning an object and the problem consists in changing a percipient's expectations towards that particular object by pointing towards those aspects of the object which would make a change of expectations desirable and justifiable. The task of a theory of criticism is to reconcile social necessities with the position of a relational theory of value. The intersubjective value of a work of art is considered to be acceptable if it results from a reasonable reconciliation of divergent expectations concerning objectively verifiable aspects of the work of art.

CHARLES LALO (Paris): *L'Analyse Structurale des Oeuvres d'Art.* (not presented)

The crucial problem in aesthetics is the passage from facts to values. It is important to derive values from facts without being arbitrary. From Plotinus to Bergson and Croce, aestheticians have tended to consider works of art from a mystic point of view, as unities or organisms destroyed by analysis. However, aesthetic analysis is as legitimate as analysis in biology or sociology, both dealing with organic unities. Also, in the past there has been a tendency to analyse works of art by means of preconceived systems, whether metaphysical (Plato, Kant, Hegel), or positivist (Taine, the Psycho-analysts, the Neo-Pythagoreans). Contemporary gestalt psychology, however, seems to offer, without excessive

systematization, concepts which are helpful for the structural analysis of works of art. The ideal of aesthetic analysis is to arrive at the maximum of facts and their possible values, leaving it to subsequent investigation to determine what portion of these possibilities is realized, or lost, in the mind of a given observer. As there is no (absolute) truth but probability in science, so in aesthetics values are ascertained only as possibilities.

H. S. LANGFELD (Princeton). *Psychological Aesthetics in America Today.*

Aesthetics in America has never been a popular discipline, as evidenced by the relatively small number of courses and publications in the field. The greatest interest in aesthetics has been from the philosophical point of view. (Dewey, Kallen, De Witt H. Parker, Santayana, Lipps, Bullough, Prall). A number of psychologists have also made valuable qualitative and semi-philosophical additions to our knowledge of aesthetics. (Münsterberg, R. M. Ogden, Koffka, C. C. Pratt, P. Farnsworth, Chandler). Experimental investigations of the problem of pleasing proportions raised the question of social values in determining preferences. The measurement of artistic talent and achievement has occupied the attention of many psychologists. (C. Seashore, N. Meier, Kwalwasser-Ruch) The projection method of studying personality is easily applied to artistic production. (Rorschach) "Experimental aesthetics is not an easy subject for research because of the difficulty of control and the variability in judgment, but considerable progress has been made and there is evidence of continuance."

The following general observations concerning the sessions might be offered. The majority of the papers were concerned with a justification or a definition of aesthetics. The dominant approach seemed to be in terms of traditional metaphysical concepts. There was a preoccupation with notions of an absolute in one form or another, and only a small number of papers followed a scientific-empirical approach.

AESTHETICS IN FRANCE

Because of translation delays, our French issue is again postponed; next June is now the objective.

The second issue of the *Revue d'Esthétique*, for April–June 1948, contains these articles: CHARLES LALO, *Le terrible, le paisible, le risible;* LUCIEN RUDRAUF, *L'illusion creatrice;* P. SERVIEN, *Science et esthétique;* E. MONOD-HERZEN, *Principe d'unité et déformation;* MADELEINE VINCENT, *Thaumata;* M.-M. BOUET, *Le vol à voile.*

CHARLES LALO spoke on *L'esthétique du rire* at the meeting on November 20 of the *Société Française d'Esthétique.* He made the following points: "Les théories du rire esthétique sont nombreuses. Elles passent pour être très divergentes et inconciliables. En réalité, toutes sous-entendent implicitement la notion de valeur, ou plus précisément de dévaluation, qui permet de les ramener à une certaine unité. Par exemple, plaquer du mécanique sur du vivant (Bergson), c'est un cas particulier de la hiérarchie des valeurs vitales et matérielles. Epargner de dépenses affectives (Freud), ce n'est risible que lorsque cette épargne dévoile des valeurs inférieures refoulées: telle la grivoiserie. Il est possible d'appliquer la formule de la dévaluation aux nuances les plus variées du risible: depuis le ridicule ou l'ironie jusqu'au comique, à l'humour ou à l'esprit."

LETTERS PRO AND CON

To the Editor:

I have just read in the current number of the *Journal of Aesthetics** the record of the correspondence between you, Alfred Einstein, Richard Müller-Freienfels and others.

I'd like you to know how much I appreciate the stand you have taken. It is the only one possible if we are loyally to adhere to the principle of freedom of thought, of inquiry and of expression. Indeed, the issue involved goes far beyond the immediacies of the challenge made by Alfred Einstein. For Müller-Freienfels was a philosopher and aesthetician of distinction long before the Nazis began their ruin of the German people, and such compromises as he made with the menace of their obscene and ruthless power, were in line with a precedent among philosophers and scientists which stretches from Galileo and Descartes to Soviet academicians and biologists in our own South. As M. Müller-Freienfels points out regarding his own utterances, the writer's conformation is ambiguous or ceremonial, and what he really thinks and believes is unmistakable. He may not be of the stuff that martyrs are made of; but if he seeks to escape the Inquisition for himself, he does not betray others to it.

Suppose, however, that he had become a genuine convert to Nazi authoritarianism, and a convinced propounder of its dogmas. It would still be true that to refuse to hear what he has to say, to suppress and proscribe it, would be to betray the principles of intellectual freedom without which philosophy can be neither the exercise of reason nor the pursuit of truth, and science is corrupted from free inquiry into authoritarian dogma. The full consequences of such an attitude was demonstrated long ago by John Stuart Mill. A re-reading of his Essay on Liberty would be a tonic spiritual exercise for the entire generation of present-day intellectuals.

H. M. Kallen

To the Editor:

Professor Sloane's excellent article on "The Tradition of Figure Painting . . ." (*Journal of Aesthetics*, September, 1948) gives further currency to the oft-repeated misconception of Taine's aesthetics as derived from Auguste Comte's positivism. I am now engaged in a study of Taine's development and have reached the conclusion that such was not the case. Here are some of the relevant facts:

1) Taine did not read Comte till long after his key ideas had been formulated. Comte's *Course of Positive Philosophy* was published between 1830 and 1842, yet there is no mention of it in the many documents which survive from Taine's formative student years at L'École Normale, 1848–1851 (See André Chevrillon, *Taine: formation de sa pensée*, pp. 51–242). The evidence seems to indicate that he first read Comte's famous work in 1860–1861, and that he had not studied it carefully till 1864, when he wrote an article for the *Journal des Débats* on its second edition (See D. D. Rosca, *L'Influence de Hegel sur Taine . . .*, pp. 261–264, note; and 354).

2) Further, Taine never was a positivist, or, if he did incorporate some of the ideas of that school, he did it critically and with a difference. This is evident from his well-known essay on Mill, which first appeared as an article in the *Revue des Deux-Mondes*, March, 1861, and did not receive its later title, "Le Positivisme anglais . . ." until its appearance in book form, 1864. Actually, Taine's development was molded primarily by his early allegiance to Spinoza, modified by his studies in Hegel and others; the "positivistic" elements in him, where they can be detected, are late and secondary (see Rosca, *op. cit.*, pp. 224–280, where this issue is discussed in some detail).

How, then, shall we account for the many references to Taine as a positivist? The answer is fairly simple. First, he *did* share with Comte, and many others of his generation, a profound interest in the sciences; details are irrelevant here, but in general Taine's studies

* September, 1948; Vol. VII, No. 1, pp. 68–72. (Ed.)

were focussed around the young science of psychology. That many elements in his thought "bear a close analogy to those of the evolutionary scientific system proposed by Comte" does not prove either that he was indebted to Comte or that he was a positivist.

Second, and perhaps most relevant for an understanding of changing tides of taste and thought in France, we must realize that the charge of "positivist" was a ready battle-cry in the intellectual conflicts of the day, as with a critic like Brunetière. As a matter of fact, critics of Taine can be placed in two groups: the idealists, who accuse him of being a positivist; and the materialists, to whom he is a benighted idealist. The truth is surely somewhere in between.

SHOLOM J. KAHN

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